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ILLUSTRATION.

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London Streets and their Travellers.

IF the total length of the London streets (2,500 miles) is astonishing, the gross amount of traffic continually going on in them is absolutely astounding; and, even so, if the attempt to form a concrete conception of the aggregate number of inhabited houses in the metropolis somewhat confuses the mind, the endeavour to frame to ourselves an idea of the collective crowd of their inhabitants positively confounds it.

The entire number of houses ("inhabited, uninhabited, and building") which at the time of taking the last census, were concentrated within the 117¼ square miles forming the area of "London according to Act of Parliament," amounted to rather more than 455,000; so that, adding the average annual rate of domiciliary increase (7,500), there must be now some 30,000 more, or 485,000 dwellings altogether. Hence, we shall be not very wide of the truth if we say that, in round numbers, the metropolitan houses at the present time amount to nearly half a million; and that they are consequently sufficient, with an average frontage of five yards, to form, as has been already shown, one continuous row of buildings right round the island of Great Britain, from the Land's End to John o'Groat's (600 miles), from John o'Groat's to the North Foreland (540 miles), and from the North Foreland back again to the Land's End (320 miles) = 1,460 miles altogether. Now, according to the same Government authority, the population of the metropolis was a fraction more than two millions and three-quarters of "persons" in 1861, and a little above three millions and a quarter in 1871; and, therefore (the rate of increase being about half a million per decenniad), the number of people at present located within its legal boundaries may be taken in round numbers, at three millions and a half of males and females in the aggregate.

But who can have an adequate notion of three and a half millions of souls "in the lump"? Some ingenious *savant*, with a considerable amount of spare time on his hands, and no end of patience in his constitution, has counted the number of distinct ova in the milt of a codfish; others have summed up how many millions of pores there are in the hundreds of square inches of epidermis which go to make up the human skin; others, again, of an egotistic turn, have reckoned the gross number of i's contained in the Bible; whilst others, maybe, have gone so far as to estimate even the collective motes in a cubic foot of sunbeam. But, surely, all this is the very *delirium tremens* of statistical intoxication. The sense of magnitude and number is merely relative: an elephant is but a tiny sucking-pig in comparison with a mammoth; even as the myriads of decomposing animalcules, which are said to give rise to the phosphorescence of the sea on a summer's night, are little more than a knot of fireflies in proportion to the infinity of Suns composing the "star-dust" which bespangles the Milky Way. Let us, then, give over grasping at the flimsy shadow of large numbers, and endeavour to seize the substance of solid facts which are more readily comprehensible by the mind.

Well, the population of London is the 1-210th part of that of the entire world! (which Balbi, in his "*Bilancia Politica del Globo*," estimates at about 736¾ millions of individuals); it is, moreover, according to the data of the same authority, 1-111th of all the people in Asia, 1-65th of all those in Europe, 1-17th of all in Africa, and just about 1-11th of the aggregate population of the enormous continent of North and South America; whilst it is as nearly as possible treble the whole of the persons in the whole of Australia. Further, there are close upon the same number of individuals in the metropolis as there are in the entire Netherlands, almost half as many again as in the aggregate Republic of Switzerland, and rather more than twice as many as in the kingdom of Denmark.*

Such, then, is the population of the metropolis proper, as compared with that of other territories. Let us now regard it relatively to that of other cities. Well, London is nearly twice as thickly peopled as Pekin (which is said to be one of the most densely populated capitals in the world); but then, on the other hand, it contains almost thrice as many persons as Jeddo, and just treble the number of males and females that are located in Paris; more than four times as many as there are in New York; nearly seven times as many as St. Petersburg; eight times as many as Vienna, Madrid, or Berlin; nine times as many as Naples, Calcutta, Moscow, or Lyons; thirteen times as many as Lisbon, Grand Cairo, Amsterdam, or Marseilles; not less than twenty times as many as Hamburg, Mexico, Brussels, or Copenhagen; and very nearly thirty times as many as Dresden, Stockholm, Florence, or Frankfort.

Further, in comparison with our own large cities, it contains nearly eight times as many people as the united towns of Manchester and Salford, and the same proportion as regards Liverpool; nine times as many as Glasgow; twelve times as many as Birmingham; fourteen times as many as Dublin; and upwards of twenty times as many as Edinburgh; while compared with the four constituent portions of the United Kingdom, the number of people located in the metropolis is about one-sixth that of the entire population of England; two thirds that of Ireland; rather more than the aggregate population of Scotland; and nearly thrice as many as the whole of the people in the whole of Wales.

And now let us see by what simple means we can arrive at a sense of this immense crowd of human beings *collectively*; so that the mind may be able to take in the entire mass at a single glance, or, as it were, to have a bird's-eye view of the whole. Supposing, then, each person to occupy a space of 2 ft. by 1½ ft., or 3 square feet of ground altogether, and every half a dozen persons to be thus packed within the compass of 2 square yards, we have the following simple proportion, viz.: 6 : 2 :: 3,500,000 : 1,166,666·66, for the entire number of square yards of ground which the gross population of London, under such circumstances, would cover. Now 1⅛ million of square yards = 241 acres, or upwards of one-third of a square mile; so that it would require an area considerably larger than that of the entire city and liberties of Westminster (216 acres) to contain the compressed multitude, and a district just about as large as that of St. George's-in-the-East (243 acres) to afford even standing-room for the whole of the immense crowd.* Moreover, it was computed that on the day of the Duke of Wellington's funeral there were a million and a half of people out in the streets to witness the procession, and that they covered the pathways all along the line of route for a distance of three miles. Accordingly, it follows that, were the whole of the metropolitan population ever to be congregated in the public thoroughfares at one and the same time, they would form a dense mass of human beings exactly seven miles long; for 1·5 : 3 :: 3·5 : 7. Or, to put the matter still more strikingly: if the entire people of the capital were to be drawn up in marching order, two and two, and each couple to be 2 ft. apart from the next, the aggregate length of the great army of Londoners would be not less than 662 miles, or long enough to reach from London to Inverness; while, supposing the file to move at the rate of three miles an hour, it would take more than nine days and nights for the aggregate troop of the metropolitan population to pass by. Who can wonder, then, that a babe is born within the London boundaries every five minutes throughout the year? or that very nearly 220 Londoners die every day in the course of each twelvemonth?

Maitland tells us that London, a century ago, had absorbed into its body one city, one borough, and forty-three villages; and yet the ravenous maw of the metropolis continues daily devouring suburbs, and swallowing up green field after green field; for the builders still go on raising houses where the market-gardeners, a little while back, raised only cabbages,—further house-room

* The preceding as well as the following calculations have been made from the tables given in the "*Almanac de Gotha*."

* As a convenient guide for estimating such magnitudes, it may be mentioned that Bedford-square occupies an area of just about 6 acres (reckoning the entire quadrangle inclosed within the walls of the surrounding houses), Russell-square, 10 acres, and Lincoln's-inn-fields, 12½ acres.

being required every year (what with the influx of "little strangers" and the accession of immigrants from the country and abroad) for half a hundred thousand new-comers at least. Hence the capital now embraces not only the county and episcopal city of London itself, as well as the episcopal city and liberties of Westminster; but it includes the two great boroughs of Southwark and Greenwich, besides the towns of Woolwich, Deptford, and Wandsworth, together with the *quondam* watering-places of Hampstead, Highgate, Islington, Acton, and Kilburn; the old fishing-town of Barking; the once-secluded and ancient villages of Ham, Hornsey, Sydenham, Lee, Kensington, Fulham, Lambeth, Clapham, Paddington, Hackney, Chelsea, Stoke Newington, Newington Butts, Plumstead, and many other places, which were once far away in the country. It comprises, moreover, the jurisdiction and lieutenancy of the Tower and Tower Hamlets, and of the Hospital of St. Katherine, as well as the lordship of the Duchy of Lancaster in Westminster. Well, therefore, might M. Horace Say, the celebrated French economist, exclaim,—"*Londres n'est plus une ville: c'est une province couverte de maisons!*" Indeed, the monster metropolis comprehends at present within its boundaries, as regulated by law, the territories of what were formerly four Saxon commonwealths and kingdoms,—viz., the dominions of the Middle Saxons, East Saxons, the South Rick, and the Kentwaras, who once ruled over its surface; while buried beneath the houses and the pavement are the remains of streams which are now made to do the duty of a common sewer, but which at one time were of sufficient capacity to be the scene of many a naval engagement. For Stowe, in his "Survey" records that at the beginning of the fourteenth century (35 Edw. I.), Henry Lacy, Earl of Lincoln, complained to the Parliament then holden at Carlisle, that "whereas in times past the course of water running at London, under Oldborne Bridge and Fleete Bridge, into the Thames, had been of such breadth that *ten or twelve ships' navies at once, with merchandise, were wont to come up to the aforesaid 'Bridge of Fleete, and some of them to Oldborne Bridge as well*, now the same course, by reason of the filth from the tanners, as well as by diversion of the water made for the mills standing without Baynard's Castle, and from divers other impediments, is sore decayed; so that the ships cannot enter as they were wont, and they ought."

Having, then, given the reader as comprehensive a sense as possible, not only of the size and population, but also of the number of houses and the length of the streets composing this consummate capital of ours,* we shall now proceed, in due order, to set forth the aggregate amount of traffic which is continually traversing its thoroughfares.

The streets of London are, assuredly, the grandest and most remarkable of all the sights that London contains. Not that this is due to their special architectural beauty, though at the West End, and even in some of the new parts of the City, there are highways which are long lines of palaces; nor yet is it owing to the magnificence of its shops, gorgeous, nevertheless, as some of them may be with the richest products of the world; neither is it referrible to the broad green fields of its prairie-like parks,—those vast aërial reservoirs (great sylvan tanks, as it were, of oxygen) for the supply of pure air, health, and spirits, to the walled-up multitude; neither, again, is it to be ascribed to the extent of its capacious docks at the East End, where the surrounding streets have all the maritime grotesqueness of an amphibious Dutch town from the intermingling of the many mast-heads with the chimney-pots, and where the sense of the aggregate wealth stored within the neighbouring warehouses is positively overpowering to contemplate. But these same London thoroughfares are, assuredly, the finest of all sights,—in the world, we may say,—on account of the never-ending and multiform varieties of life to be found in them at all hours of the day. Beyond doubt, the enormous multitude for ever sweeping along the principal metropolitan highways strikes the first deep impression upon the stranger's mind; and we ourselves never contemplate the roar of the mighty human tide without feeling that here lies the real grandeur of the colossal colony,—the one distinctive feature that gives a special sublimity to this giant town.

Travellers speak of the awful magnificence of the great torrent of Niagara, which is the broad unbroken fall of an entire river over a vertical precipice, and where the cataract of descending water is nearly 1,500 yards wide, and the average quantity of liquid for ever pouring over the rocks in one immense and terrific flood is said to amount to as much as 700,000 tons weight, or very nearly 157,000,000 gallons a minute. Still, what is even this enormous cascade in grandeur to the vast human flood, the stupendous living torrent of thousands upon thousands of restless souls, each quickened with some different purpose, and ever hurrying along the great thoroughfares of this "very great metropolis"? And if the roar of the precipitated waters of Niagara at once bewilders and affrights the mind, assuredly the riot and immensity of the London traffic not only stun but appal the brain of those who hear it for the first time. There is no scene in the wide world which can impress the mind with such a sense of indomitable labour and perseverance as is inspired by the seemingly never-ending and never-tiring industry of the torrents of people and conveyances perpetually pouring along the metropolitan streets. If the Desert be the very intensity of the sublime from the almost-tragic feeling of loneliness which the scene induces,—the awful stillness and bareness of the vast arid ocean of desolation encompassing the traveller,—surely, this mighty modern Babylon is equally sublime,—though, for the opposite reason: from a sense of the infinite multitude of human beings with which we are continually being surrounded, and yet our comparative friendlessness and isolation in the midst of such a vast concourse of our fellow-creatures.

Let the visitor from some quiet country or foreign town behold the City, or even the Strand, Oxford-street, Regent-street, or Piccadilly, at five in the day, and see the people crowding the great lines of thoroughfare like a flock of sheep in some narrow rural lane, with the vehicles packed full of human beings and jammed as compactly together as the very stones of the pavement itself. (As many as 800 carriages are said to pass along Pall Mall, by her Majesty's Theatre, every hour of the day during the season.) Let him find, moreover, that go which way he will through the City, there is the same long dense commercial train of human beings, cabs and omnibuses, carriages and carts flooding every one of the leading thoroughfares,—the same black throng of "bread-winners" (some hurrying in hot haste after the "nimble ninepence," and others plodding along steadily, but surely, in quest of the "slow shilling,") pervading each of the principal streets almost as far as he can travel before nightfall; let him find, too, every one of the great civic arteries pouring its life-stream into the mighty heart of London, each charged with its thousands of human globules, and all busy, as they circulate through the bricken ducts sustaining the vitality, energy, and well-being of the land; and assuredly he will allow that the world has no wonder, among the whole of its far-famed seven, in any way comparable to this.

Let us, however, descend to particulars, and endeavour to set forth the actual amount of traffic which daily goes on in these same wondrous streets of London. According to a return made by the Inland Revenue Office in 1850, when the mileage duty, as well as the tax on horses and carriages, was still in force, the number of horses at that time within the metropolis was upwards of 20,000, and consisted of 10,000 carriage, job, and cart horses, 5,700 cab horses, and 5,500 omnibus horses. But there were then not quite 3,000 cabs, and rather more than 1,300 omnibuses in London; whereas, according to the returns of the Metropolitan Police (who have had the licensing of these vehicles since the year 1870), the number of cabs in 1872 had increased to very nearly 8,000, whilst the number of omnibuses had declined from 1,350 to 1,289; so that reckoning two horses to each cab, the number of "hackney-carriage" horses cannot be less now than 16,000, and eight horses at least to each "short-stage," the number of omnibus horses must be upwards of 10,000, so that the gross total of such animals at present in the Metropolis (including the 10,000 private-carriage, job, and cart horses) must be rather more than 36,000, instead of 20,000 some quarter of a century ago. To this number, moreover, must be added the horses which come up to the Metropolis daily from the surrounding districts, and these are said to amount to as many as 3,000 or more. Consequently, the total of the London horses at the present time may be safely set down, in round numbers, at somewhere about forty thousand.

And now for the amount of "travel," as the 'bus-people term it, performed by this united cavalcade. The average journey of each omnibus is said to be six miles, and this length of ground is, in many cases, gone over as often as twelve times in the course of the day, or, as it is styled, "six journeys there and six back." Some 'buses, however, perform the journey only ten times, and some (though they form but a small minority of the whole) do so even less. Estimating, then, the average distance travelled by each of the London omnibuses at between sixty and seventy miles *per diem* (and this, we are assured, is rather under than over the usual amount), and computing the number of such vehicles running daily through the London streets at 1,200, we have an aggregate of 70,000 to 80,000 miles per diem, or upwards of twenty-five million miles *per annum*,—a distance which is more than one fourth of that of the earth from the sun. And that this estimate, large as it may seem, in no way exceeds the truth, is proved by the fact that the money paid for mileage duty by the 1,350 short stages, in the year 1849–50, averaged just about 10*l.* per 'bus per month, and amounted altogether to 162,000*l.*; so that this, at the rate of 1½*d.* per mile, would give a gross amount of annual mileage which is rather more than the total above mentioned.

The distance travelled by the collective cabs in London may be estimated as follows:—Each driver has to pay to the proprietor of the vehicle from 12*s.* to 15*s.* per diem; so that, as there are just upon 8,000 cabs in all London, and these, one with another, may be said to go twenty miles each daily, in order to earn (what with long and short fares, extra persons, &c.) rather more than the sum the drivers have to take home to the owner for the hire of their conveyances, it follows that their aggregate daily travel must amount to 160,000 miles, or, in round numbers, to upwards of fifty-eight millions of miles in the year.

Thus, therefore, we arrive at the conclusion

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* The following table is given in the Police Returns printed in the year 1872:—

Table showing the Number of New Houses Built, as well as the Number and Length of the New Streets and Squares formed within the Metropolitan Police District between the years 1849–71.

Periods.	Number of New Houses built.	Number of New Streets and Squares formed.		Length of New Streets and Squares.		Annual Average Number of New Streets and Squares.		Annual Average Length of New Streets and Squares.		Annual Average Number of New Houses.
		Streets.	Squares.	Streets, in miles.	Squares, in yards.	Streets.	Squares.	Streets, in miles.	Squares, in yards.	
1849–54	40,743	1,288	9	237	1,290	257	1½	47⅜	247½	8,148⅔
1854–62	52,949	1,513	25	239	953	189	3⅛	29⅝	119⅛	6,618⅓
1862–64	35,163	825	10	164	1,321	412½	5	82	660¼	17,581¼
1864–67	48,585	787	12	127	1,037	262⅓	4	42⅓	345⅔	16,188⅓
1867–68	15,963	491	4	88	1,490	491	4	88	1,490	15,963¼
1868–70	31,939	927	7	171	1,569	463½	3½	85½	784½	15,969½
1870		230	1	42	1,059	230	1	42	1,059	9,682
Feb–Dec 1871	9,682									
	8,698	226	2	38	722	226	2	38	722	8,698
Total...	243,697	6,277	70	1,106	9,370	285⅞	3⅘	50⅘	425⅔	11,077⅘

Number of New Houses being built in 1871, = 3,598.

By the above table it will be seen that in the twenty-two years, from 1849–71, there were constructed annually on an average 11,600 new houses and fifty miles of new thoroughfares, consisting of 285 new streets and three new squares. It will also be found that the greatest number of new houses was built in the years 1862–64, when more than 17,500 were erected annually, and the smallest number in the years 1849–54, when only 8,148, or less than half that number, were constructed. And also that the greatest number of new streets was formed between 1867 and 1868, when the average number reached 491, and the average length of the new thoroughfares formed in the course of those years amounted to eighty-eight miles; whilst the fewest new streets were made between 1854 and 1862, when the average number was only 189 per annum; and the average length of the whole just upon thirty miles.

that the 25,000 omnibus and cab horses in London travel somewhere about 250,000 miles per diem! What distance the remaining 15,000 carriage and cart horses,—as well as those which come up from the country,—journey in the course of each day, there are no authentic records to enable one to form an accurate estimate. But, supposing each animal to go only five miles on an average, the total length of the ground travelled in the day by the whole of the remaining troop would amount to another 75,000 miles; so that we land at the following result, viz.: the gross amount of London traffic by the collective 40,000 London horses is at the very least 300,000 miles per diem, or about as far in the course of the year as it is from this globe to the sun!

The total length of the London streets we have already shown to be 2,500 miles; hence it is a simple rule of proportion sum to demonstrate that each mile of pavement throughout the metropolis must be traversed 120 times during the day, or about a thousand times a week, by some vehicle or other. Nor is this very wide of the truth; as, indeed, the observations which have been made as to the actual amount of traffic going on in different parts of the City at different periods of the daily working hours, tend indisputably to prove. For, according to an elaborate table prepared by Mr. Haywood, the well-known City surveyor,* there appear to be two tides, as it were, of locomotion flowing daily through the great highways of the City,—the one coming to the flood, as it were, at eleven o'clock in the forenoon, up to which time the number of vehicles goes on gradually increasing, and that at so rapid a rate that there are nearly twice as many in the streets an hour before midday as there were at nine in the morning (see table given below). After eleven a.m., however, the tide of the City traffic begins to ebb, and the number of vehicles to decrease regularly from that time till two p.m., at which hour the sum total of the conveyances in the streets is about one-sixth less than it was three hours previously. Then, at two in the afternoon, another change sets in; and the crowd of omnibuses and cabs, carriages and carts, commences swelling again, and continues doing so till five in the evening, when there are some few hundreds more vehicles in the leading thoroughfares than there were at eleven in the morning. Finally, after five p.m., the locomotive current begins to ebb once more; nor does it attain its next flood till an hour before noon the next day. And so the mighty tide of traffic goes on, ebbing and flowing day after day, and wearing away the stones of London in its course,—the same as if it were the torrent of Niagara itself, pouring its 700,000 tons of water every minute over the rocks in its path.

Moreover, by the table before referred to we find that the total number of vehicles traversing the principal streets of the City in the course of twelve hours amounts to the prodigious sum of 125,000 or one-eighth of a million. Many of these, however, it must be borne in mind are reckoned more than once in the same return; nevertheless, if we take merely the number appearing in such distinct lines of thoroughfare as Holborn and Fleet-street, Blackfriars Bridge and London Bridge, Leadenhall-street, Bishopsgate-street, and Finsbury-pavement, even then the amount of the City traffic reaches nearly 60,000 vehicles passing and repassing through the principal streets between the hours above mentioned.

Still, the thoroughfares within the City of London are only one-fifth the length of those without them; and as there are two distinct lines of streets traversing London from east to west, each six miles long, and four distinct highways stretching north and south, which are respectively five miles at least in length, it will be found that at five p.m., when almost the whole of these main ducts may be said to be filled with the flood of the day's traffic, there is nearly one continuous stream of omnibuses, cabs, and carriages, carts, and vans, as well as foot-passengers, sweeping through London, at one and the same time, which is more than thirty miles long altogether!

* The subjoined table gives the data upon which the above statement is based:—

Return by Mr. Haywood (the City surveyor) showing the Number of Vehicles passing in the course of Twelve Hours (from 9 a.m to 9 p.m.) through twenty-four of the Principal Thoroughfares in the City of London:—

London Bridge	13,099
Cheapside (by Foster-lane)	11,053
Poultry (by the Mansion House)	10,274
Temple Bar-gate	7,741
Holborn (by St. Andrew's Church)	6,906
Ludgate-hill (by Pilgrim-street)	6,829
Newgate-street (by the Old Bailey)	6,375
Leadenhall-street	5,930
Blackfriars Bridge	5,262
Cornhill (by the Royal Exchange)	4,916
Gracechurch-street (by St. Peter's-alley)	4,887
Bishopsgate-street Within (by Great St. Helen's)	4,842
Aldgate-street (City boundary)	4,754
Finsbury-pavement	4,460
Bishopsgate-street Without	4,110
Eastcheap (by Philpot-lane)	4,102
Fenchurch-street	3,642
Smithfield-bars	3,108
Tower-street (Mark-lane)	2,890
Aldersgate-street (by Faan-street)	2,590
Upper Thames-street	2,331
Lombard-street (by Birchin-lane)	2,228
Threadneedle-street	2,150
Lower Thames-street (Botolph-lane)	1,380
Total for twenty-four thoroughfares	125,859

Table showing the Ebb and Flow of the Traffic in the City of London in Twenty-four of the Principal City Thoroughfares for each Hour of the Day from 8 a.m. till 9 p.m.

Total Number of Vehicles passing along the principal City Thoroughfares:—

At 9 a.m.	6,576	At 3 p.m.	11,068
At 10 a.m.	9,751	At 4 p.m.	11,351
At 11 a.m. (*morning flood*)	12,208	At 5 p.m. (*evening flood*)	12,543
At 12 a.m.	11,686	At 6 p.m.	11,342
At 1 p.m.	11,408	At 7 p.m.	9,757
At 2 p.m. (*afternoon ebb*)	10,466	At 8 p.m. (*evening ebb*)	7,694

Average—10,488 vehicles per hour.

Comparative Return by M. D'Arcy as to the Gross Amount of Traffic in the Seven Principal Thoroughfares of Paris in the course of Twenty-four hours:—

Boulevards des Italiens	10,759
Boulevards des Capucins	9,070
Boulevards Poissonnière	7,720
Boulevards St. Denis	9,600
Avenue des Champs Elysées	8,959
Avenue des Filles du Calvaire	5,856
Rue du Faubourg St. Antoine	4,300

Average—2,396 vehicles per hour.

"SEMI-GOTHIC" ARCHITECTURE.

A CAUSTIC correspondent once described the style of a new building, in these columns, as "Lunar Gothic." The phrase does not represent badly some of the extravagant and laboured whimsicalities, which the desire for what is thought picturesque has given rise to from time to time. This eccentricity of modern Gothic is less noticeable of late; partly that it has really been modified by the prevalence of a better and quieter taste, partly perhaps that we have got more used to eccentric architecture, and are less disturbed by it than we were fifteen years ago. But the modifications of Gothic practised at present, by those who do not profess to be purists, tend rather in the opposite direction, and consist not, like "Lunar" Gothic, in an exaggeration of all the points of the style, but in the softening and losing of these, by blending them with details proper to other styles, or by altering the character of Gothic detail till it assimilates to something else. This method of dealing with it has been practically carried out for some time; and the fact of the frank employment of the term "semi-Gothic," to describe one or two new buildings recently carried out, only shows how much this kind of half-and-half style is taking its place as a distinct element in the architecture of the day.

The aim is the same in both cases,—novelty, and on the whole the semi-Gothic system is unquestionably more philosophical and suggestive than the other. Exaggeration, and consequent want of repose, are entirely at variance with the true spirit of architecture. The multiplied chamferings, the disproportioned openings, all arch and no jamb, which seemed to be considered with many practitioners the necessary elements for producing what may be called "go" in modern Gothic, are tending to fall into disrepute again, as oddities of any kind always do before long. The opposite tendency, the attempt to combine in new forms the elements of Gothic and Classic architecture, is so far in vogue that with not a few designers it has become almost matter of course. It is a deliberate repetition, on principle, of what was done unconsciously and naturally by the Elizabethan architects; though the results of the experiment are different enough in some ways.

There are two or three different principles on which semi-Gothic architecture may be evolved. One is that on which Pugin always said the Houses of Parliament were designed—"Gothic details on a classic body"—in other words, a Classic arrangement of plan and mass, with Gothic ornament. This, however, is not a very distinctive source of novelty, for there have been various buildings, during the true Gothic period, arranged and planned with the symmetry of a Greek temple, and affording a practical contradiction to the idea that irregularity is in every way of the essence of Gothic—an idea which was the foundation of Pugin's criticism of the structure alluded to. There has, however, been evident in recent buildings of decidedly Gothic design an effect of solidity and squareness of character at variance with the spirit of English Gothic, and which is almost entirely due to the influence of French Mediæval architecture, where the Romanesque influence predominated so much more, and retained its hold so much longer than in this country. This, however, may be carried out without in the slightest degree mixing the Gothic character with anything derived from opposite schools of architecture. But it is probable that the style of the French Gothic capital, with its square abacus and large angle foliage directly descended from the "Composite" capital of Rome, suggested the intermixture of style in the treatment of this feature, which has been so prevalent in English work of late. We meet with capitals in Gothic buildings which are much more Classic in feeling than anything for which English Gothic could show a precedent. Still more, in the other direction, do we meet with capitals and other carving in professedly Classic buildings, which are essentially Gothic in feeling and treatment. It is becoming recognised that the effect of detail of that sort largely depends on conditions of light and atmosphere; and the natural result of this is to induce a certain similarity of detail in buildings otherwise remote enough in style. The old delicate and symmetrical Classic capital is rarely seen now in buildings by any English architect of talent and originality, however professedly Classic may be his style and sympathies: it is falling into neglect as a form not only grown hackneyed by repetition, but as ineffective and tame in this climate.

The essence of the "semi-Gothic" movement, however, consists in more marked and important variations from rule and precedent than are shown in this generalising of the style of carved ornament. It is shown in the combination in the same building of features derived from different structural systems and different principles of architectural expression. This may take the form either of the introduction of Classic features into a building mainly Gothic, or the reverse process. The latter has not been so much attempted as the former; and naturally, for it is usually a complete failure. The most common instance of it is the introduction of the buttress form into Classic architecture. This has been attempted not infrequently, but the introduced feature always appears like an interloper. The square and precise forms of Classic design will not tolerate the intrusion of the sloping lines of the buttress; and there is a more innate kind of incongruity in it, too; for the buttress emphasises structural dynamics in a way which the statical repose of Classic architecture shrinks from. The combination of the spire with Classic architecture has been attempted with more success; the typical example being, of course, Barry's Halifax Town-hall, the original of several less refined imitations. The opposite process of engrafting Classic features upon Gothic is in part formed by reversing the two processes just hinted at; by substituting the pilaster where the buttress would be expected, and by discarding the tapering spire for something of the campanile form. This latter process has really given rise to some new combinations in design, of a very successful kind; and, indeed, the Italian campanile in its finest and most striking forms has more affinity with Gothic than with Romanesque or Renaissance architecture. The substitution of the pilaster for the buttress, and of the square pier for the Gothic-shafted pier, in a pointed-arch building, is the most marked form of "semi-Gothic," and is the most marked feature, usually, in any building which can be so denominated. And in structures where there is no large-span roof to exercise a powerful thrust on walls not tied in by cross-walls, there is really nothing illogical or un-architectural in this combination. Our notions of Gothic architecture are too exclusively derived from the study of buildings in which these conditions were present, and of course affected the design in a most important manner. But in modern Gothic, of a civil or domestic class,—wherever, in short, there are not large areas to be crossed by heavy roofs, the buttress is a far less essential element than it is often considered to be. The omission of it, and the substitution of a flat wall treatment in combina-

tion with pointed arches and Gothic detail is, in such a case, merely an admission that the structural influences which were the chief creative agent of the fully-developed Gothic style are absent or modified, and the architectural treatment and expression are modified accordingly.

The style of "semi-Gothic" which we certainly do not like, however, and for which little reason can be given but the attempt at novelty, is that which we have observed to be very prominent of late among designs for Dissenting places of worship. It is difficult to define the exact characteristics of this manner; but it seems to consist in a combination of some of the qualities of Classic and Gothic style respectively, which are most incongruous when united. A heavy, low, pedimented gable, for instance, is combined with pointed arches, or round-arched openings with heavily panelled soffits are combined with tracery far too light to assimilate with the framework in which it is set. These are two instances of a kind of nondescript and heterogeneous treatment which is exhibited also in other forms, which readers may recall, though it is not easy to define their specialities without the actual object before one's eyes. The sort of thing we mean is also very prevalent in shop architecture at present, in which we sometimes see a jumble of pilasters and shafts, round windows in one story, pointed windows in another, with apparently no object but that of cramming together a number of heterogeneous architectural elements, apparently in the hope that some originality of style will be attained. But style never was attained in that way,—nothing that is deserving of such a title. For "style" means the combination of details which appear to have a common origin and a common intention in regard to effect. These "semi-Gothic" structures, consisting of features which are contradictory of each other, spring from opposite structural conditions, and aim at combining opposite artistic expressions. Their combination, however, results only in a negation of style altogether. Although we have compared the modern semi-Gothic, to a certain extent, with Elizabethan, the class of designs last named have no affinity with that at all. For the Elizabethan, though a corrupt style, was a "style" in its own way. In employing together features borrowed both from Classic and Gothic, it modified each to such an extent as to harmonise them in a great degree, and to produce a whole which was not by any means disagreeably or absurdly incongruous in its result, though obtained in a rather anomalous and, we might perhaps say, accidental manner. This latter epithet possibly explains to some extent the cause of the difference between this and the modern semi-Gothic style. The Elizabethan was not a deliberate effort to make something new, but an almost natural result of the course of architecture at the time. It is, therefore, though corrupt, not displeasing to the taste, as everything is in which the desire to surprise by novelty is evident. The old semi-Gothic, in short, was refined; the new is vulgar; for every conscious and undisguised effort to attract by singularity is vulgar, in whatever form of art; and there is none in which vulgarity, when existent, is more pronounced and more offensive in its expression than it becomes when thrown into the form of pretentious and ill-considered architectural design.

THE COURTS AND ALLEYS OF GRAY'S INN LANE AND THE NEW ACT.

THE first report on the application of the Artisans' Dwellings Bill has been made (not by the medical officer as prescribed, but) by the Surveyor to the Board of Works for the Holborn District, Mr. L. H. Isaacs. The area proposed to be dealt with may be described as a parallelogram, extending from Portpool-lane on the north to Holborn on the south, and from Leather-lane on the east to Gray's Inn-lane on the west. The length from north to south is 1,100 ft., and the width from east to west 550 ft., making a superficial area of 67,222 square yards, or nearly 14 square acres. A little to the north of this site will be found Liquorpond-street, which is to form an integral portion of the new thoroughfare from Oxford-street to Shoreditch, and which will be made 60 ft. wide; and, again advancing northwards, we come to Little Gray's Inn-lane, Tothill-street, and Laystall-street, all of which are to be widened. The inner portion of the area is cut up into courts, alleys, and streets, the mere enumeration of whose names forms a lengthy schedule.

Having set out various roads, Mr. Isaacs takes a depth of 50 ft. for building plots next Gray's Inn-road and Leather-lane, "as these frontages would command greater ground-rents than could be obtained for them if they were let for the purpose of erecting artisans' dwellings thereon;" and, with the exception of these two frontages, devotes the remainder of the space cleared to the object of Mr. Secretary Cross's measure.

He gives a schedule which shows the numbers of houses, families, and persons that would be affected by reason of the application of the Home Secretary's measure to this portion of the metropolis, or, more correctly speaking, the number of those for whom provision would have to be made in the artisans' dwellings proposed to be erected on the cleared site. According to that, out of the whole number of buildings to be demolished, 239 houses contain 1,019 working men's families, making a total of 3,661 persons!

It will be time enough to review the scheme carefully when it is actually promoted. In the meantime, one point strikes us as of very considerable and, indeed, dangerous importance. The surveyor has included a large amount of good, sound, and, in some cases, valuable property, with the view, very desirable most certainly, of widening roads. He takes, for example, the houses on the east side of Gray's-inn-road from Liquorpond-street down to Holborn. Is it supposed that this could be done under the clauses of the new Act, which declares that in settling the compensation to be paid for any lands or interests in lands proposed to be taken there shall be no "allowance in respect of the compulsory purchase of the same"? Any such endeavour would raise an irresistible storm of opposition.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

THE meetings of this Association were resumed on the 2nd inst. in the Mayor's Parlour, Town-hall, Manchester, Mr. J. G. Lynde, the president, in the chair.

Mr. A. Jacob, Barrow-in-Furness, read a paper on "Stone-breaking by Machinery," and described Blake's stone-breaking machine, which, he observed, was the best known. Mr. Jacob also gave a description of a machine in use at Barrow, which breaks stone for macadamising at a cost of 1s. per ton.

A short discussion followed, in the course of which a general opinion was expressed that machine-broken stone was not so valuable as stone broken by hand.

Mr. H. Royer, of Hulme, described the stone-dressing machine of Messrs. Coulter, Harping, & Co., of Dewsbury.

Mr. W. H. Bailey, of Salford, read a paper on the "Prevention of Kitchen or Bath Boiler Explosions, and the Bursting of Water-supply Pipes in Winter," some portions of which we print.

Mr. E. B. Ellice-Clark (Ramsgate) read a paper on the "Increased Rate of Mortality in the Towns of England." He attributed the increased mortality not to the water-closet system, but to the imperfect manner which its details were carried out, to the indoor water-closet, to imperfect sewers—including the want of ventilation—to the modern dust-bin, to the general want of sanitary knowledge, both on the part of the officials and the public, and to the house connexions with the sewers. He recommended all public Boards to use their influence to do away with the indoor water-closet, to have a thorough examination of the sewers, and to ventilate them, to eradicate the dust-bin, and substitute the daily pail system.

Mr. R. Vawser (Warrington) read a paper on "Artisans' and Labourers' Dwellings." He contended that it was the duty of sanitary authorities to provide dwellings for the working classes when private enterprise failed to do so, in order to prevent overcrowding. The attenuated houses which were run up by jerry builders were now the order of the day; scamped work in every direction; outside walls through which an ordinary breeze drove a passing shower; party walls which would not prevent tenants in one house hearing everything that was said by their neighbours; untrapped drains communicating directly with the house,—these were by no means exceptional peculiarities of modern construction; and until a Building Act was passed, making it compulsory to erect houses consistent with the necessities of the age, and arming the surveyor with power to enforce its provisions, these anomalies would continue.

Mr. T. A. Skelton (London) read a paper on "Street Lighting," and Mr. Fowler, borough engineer of Salford, on the main drainage of Salford and the progress of the work of laying the main trunk intercepting sewer.

Votes of thanks were passed to the readers of papers, and to the Mayor; and various places in the city were visited. A vote of thanks to Mr. Lewis Angell, the retiring president, was also passed; and the member dined together as usual.

THE FATHER OF THE DISTRICT SURVEYORS.

ON Wednesday, the 7th inst., Mr. Henry Baker completed his fiftieth year of office as district surveyor of St. Pancras. In our volume for last year, under the heading, "Official Longevity," we gave some notes of the appointment of himself and the late Mr. Gutch, then living, to their respective offices under the original Metropolitan Building Act, on the retirement of Mr. Crunden at the age of eighty-four. Had Mr. Baker been in the service of the State he would now be entitled to retire with a good pension. If he were, to-morrow, to send in his resignation to the Metropolitan Board of Works he would receive an official acceptance of it, and, probably, not a word more,—that is, if we may judge from their proceedings in a case of similar kind not long ago. Courtesy and kind feeling are not always amongst the virtues exhibited by modern popular bodies. Anyhow, we will not let the anniversary pass without offering to Mr. Baker our congratulations and good wishes.

A CONCRETE CHIMNEY.

AT the last meeting of the Civil and Mechanical Engineers' Society, Mr. R. M. Bancroft, vice-president, gave the following particulars of a concrete chimney executed for the River Wear Commissioners, Sunderland.

The foundation of this chimney is of concrete, 12 ft. square by 6 ft. deep, on forced or "made" ground consisting of sand and town rubbish tipped on the sea beach. The base of the chimney is carried up 7 ft. 6 in. square for a height of 24 ft. 9 in., being 4 ft. square inside, with fire-proof lining. The base moulding is 1 ft. 9 in. in height. The octagonal shaft is 30 ft. high, 1 ft. 3 in. thick at bottom, and 9 in. at top. The total height from floor of boiler-house to summit is 56 ft. 6 in. The concrete in base was mixed in the proportion of 1 of Portland cement to 8 of shingle and sand, and for the octagonal shaft, 1 of Portland to 5 of gravel and sand. After the concrete was mixed in these proportions, rubble stones were packed in promiscuously. The rate of building was 1 ft. 6 in. per day.

The outside of the chimney was coated with ½ in. of cement, mixed in the proportion of 1 of cement to 1 of sand, and divided into ashlar.

The engineer from whose designs this chimney was erected is Mr. Henry H. Wake.

ARCHITECTURE AT UNIVERSITY COLLEGE, LONDON.

THE following is a list of the students who obtained prizes in the classes of architecture at University College, at the annual distribution, on the 23rd ult.:—

Architecture: Professor T. Hayter Lewis, F.A.S., F.R.I.B.A. Fine Art Senior Class.—Prize, J. Howard Ince, of London. Junior Class.—Prize, J. Howard Ince, of London; Certificates, 2, O. C. Wylson, of London; 3, W. Murray, of Carlisle. Construction, Senior Class.—Donaldson Silver Medal, J. Howard Ince, of London; Certificates, 2, equal, P. R. Bedlington, of Aberdare, W. Murray of Carlisle. Junior Class.—First Prize, J. Howard Ince of London; Second Prize, O. C. Wylson, of London.

Engineering and Mechanical Drawing: Professor Alex. B. W. Kennedy, C.E. Mechanical Engineering.—Prize, Herbert Pearce, of Maidenhead. Civil Engineering.—Certificate, 1, P. R. Bedlington, of Aberdare. Mechanical Drawing, Section A.—Prize, Thomas Bolton, of Cheadle; Certificate, 2, F. L. Muirhead, of London; 3, L. P. Boyce, of London. Section B.—Prize, Herbert Pearce, of Maidenhead. Surveying.—Certificate, 1, P. R. Bedlington, of Aberdare; 2, James Chester, of Real de Monte.

ENGINEERING ON THE DANUBE AT VIENNA.

THE great engineering works, to which we referred in a previous volume,* at the occasion of the Vienna Exhibition, having for their object the diversion of the Danube into a more convenient channel, closer to Vienna, have at last been successfully completed. It was originally proposed that the first ship passing through the "new" Danube should have on board his Majesty the Emperor Francis Joseph, but this intention had for some reason to be abandoned, numerous ships having passed freely since the last dam keeping back the waters of the old river was cut through, in the middle of April. But the achievement of the great undertaking was nevertheless celebrated on May 30th, by a trip by the Emperor on the new stream, from the Radlau Bridge, in the Prater, as far as Nussdorf, near the Kahlenberg. This excursion was designated in the official programme the "Solemn opening of the navigation of the regulated Danube, under the auspices of his Majesty the Emperor." It was at first feared that the premature cutting of the dam was a mistake, apprehensions being felt that the opening of this last barrier to the entry of the stream into its new bed would cause destruction to the protecting shore works, not then quite completed; but the damage done by this early opening was insignificant, and soon repaired. Indeed, favoured by propitious circumstances, Nature came to the assistance of Art, and the great work, much decried by its opponents, is accomplished. It is worth while to cast a retrospective glance at the history of its execution.

It may almost be said that the course of the Danube is prescribed by the formation of the country, above the city by the narrow gap between the Kahlenberg and the Bisamberg; below Vienna, by that between Hainburg and Theben. The river, which comes down from Passau, between mountain slopes, with a considerable fall and great rapidity, brought with it, and especially formerly, considerable masses of gravel and stones, which during inundations it deposited in the valley in which Vienna is situated. Left to its own course, it continually formed new arms. In times of considerable risings, it dug new beds, caused by the deposit of fresh accumulations of stones and gravel, which were changed almost yearly, bringing with them flooding and destruction to miles of formerly fertile country. It was this capricious course of the Danube which has hitherto prevented Vienna from taking that rank amongst the cities along the mighty river to which it is entitled by reason of its geographical situation, by reason of its vast increase as the capital of a great empire, and by reason of its being the central point of the Austrian railways. The constant changes of the great water highway made the construction of permanent quays and wharfs, the erection of warehouses, &c., a matter of impossibility, and retarded the natural development of the city. Vienna, the great "Kaiserstadt," had to be content with wooden bridges, exposed every winter to destruction by drift-ice, which meant interruption of the traffic with the northern shore, and periodical disturbances in the provisioning of the city. It was compelled to seek its extension, the development of its industry, in the southern suburbs, instead of spreading along the Danube.

It is not surprising, therefore, that already in the last century the necessity of change was recognised. Plans were continually designed and submitted; protecting works were constructed, but no decisive practical result followed, in consequence of the divergent opinions prevailing, until towards the close of 1867, with the advent of a new and energetic government, the matter was seriously taken in hand. The then minister of the interior, Dr. Karl Giskra, submitted the project of a rational regulation of the course of the Danube to the Emperor, who gave his sanction in 1868, with the direction to begin the works at once. An imperial commission was appointed, which met for the first time on March 17, 1869, under the presidency of the minister of the interior. It consisted of nine members, three representatives of the government, three delegates of the North Austrian estates, and three members of the municipality of Vienna. The commission was invested with executive powers, while to it was associated a body of engineers having a consultative voice. Herr Gustav Wex, councillor of the ministry, was charged by the commission with the immediate working out of detailed plans, as well as with the superintendence of the regulation works.

Two rival projects had to be considered. The first, by Pasetti, suggested to leave the stream in its present bed, and to regulate its course by constructing engineering works securing this object; the second proposed to bring the principal arm of the Danube by means of a cutting in a slightly-curved, concave line nearer towards the city, joined to which proposal was the plan of laying dry and filling up the beds of the smaller branches of the river, with the sole exception of the Vienna Danube Canal, and of concentrating the whole water volume in one bed. Herr Wex adopted the second, newer, plan, and worked it out with the assistance of his colleague, Herr Wamek. After it had been submitted to the approval of Herr Hofrath von Engerth, the eminent engineer, and the estimated expenditure of 2,460,000*l.* had been sanctioned, the means for carrying out the works were raised in equal proportions by the imperial government, the estates of Lower Austria, and the municipality of Vienna, by a loan redeemable within fifty years.

We find full particulars of the undertaking in a lecture delivered by Herr Wex before the Austrian Institute of Civil Engineers and Architects, and printed in the organ of the Association, its *Zeitschrift*. It is an elaborate scientific essay, giving a lucid history of the efforts made during the last hundred years towards carrying out the project and the ultimate conclusion of the negotiations. The lecture attracted the attention of engineers no less than it served the non-professional man as a guide. From it we learn that the regulated Danube comprises a length of 30·344 kilomètres (18·855 English or four geographical miles), beginning at Kahlenbergerdörfel, opposite the Bisamberg, and ending at Fischamend, above Hainburg. Two cuttings had to be made; one close to Vienna, of a length of 66·38 mètres (217·79 ft.), the other below the city, 25·48 mètres (83·6 ft.) long. The latter offered few, the former the greatest difficulties. Some idea may be formed of the magnitude of the undertaking when it is stated that along the whole length of the new river bed a breadth of 284·5 mètres (933·4 ft.), with a depth in mid-stream of 3·16 mètres (10·37 ft.), representing the total contents of 12,277,787 cubic mètres (or 433,609,059 cubic feet), had to be raised or dredged—a work which has never been equalled by any other similar undertaking for the regulation of European rivers. It was next found necessary, in order to give protection to Vienna against inundations caused by high water or the breaking up of the ice, to raise the level of the right shore of the river 20 ft. above zero level; of the latter the bank was however raised only 12 ft. above that point, the ridge of the protecting dam being at a distance of 600 ft. from the river, so that the cross streets of the new "Donaustadt," to be built along the stream, have a slight fall towards the quay of 1½ in. for every 6 ft. This new quarter of Vienna will possess a quay 13,276 mètres (14,300 yards, or over eight English miles) long, and 62 mètres (203·4 ft.) wide, and be provided with wharfs for the several navigation and railway companies; along it will be laid down a double line of rails, and it is further projected to erect in the new city a central terminus for the different railways. By the filling up of the bed of the "Kaiserwasser," the principal branch of the numerous arms of the old Danube, along with its shores, 734,000 square klafters (267·6 hectares, or 661·3 English acres) of building land have been obtained and sold, in which quantity is, however, not included the land reserved for streets, squares, and public gardens. The projected principal street, running parallel with the river, is to have a length of 8,000 yards (over 4½ English miles), and as it is to have a width of 90 ft., an idea may be formed of the scale to which the works are planned. Of the minor arms of the old river, only one, that known by the name of the Danube Canal, running close to the inner city, and supplying with water several populous suburbs, was considered of sufficient importance for its preservation, on account of the facilities it offers for the traffic from the upper regions of the river to the city; and it was decided to utilise it and to improve it by deepening it in mid-channel to a depth of 2·21 mètres (7·25 ft.) under zero level. At the same time it was determined to construct a floating gate at its junction below Nussdorf, after the plans of Herr Engerth. This lock is as peculiar as it was difficult to construct, being adapted to be lowered or raised according to circumstances, and to be drawn across the canal by means of chains, so as to close the channel when required. Although since the completion of this floating barrier in 1873, no exceptional exigencies for its use have as yet arisen, its practical utility has already been tested, and it will no doubt prove of great service in time of need.

Between the lengthened Danube Canal, near its outflow at the lower end of the new Danube and the latter, a winter harbour, with an area of 115 Austrian jochs, 66·17 hectares, or 163·51 English acres, having quays of a total length of 9,673 mètres (10,579 yards, or 6 English miles), will be formed in the bed of the old river; to this must be added the quays on both sides of the regulated canal, of a total length of 13,270 mètres (14,513 yards, or 8¼ English miles). Provision is made along the new stream for the erection of wharfs, docks, warehouses for the storage of grain and corn, &c. It is also intended to utilise part of the old stream, originally intended to be filled up and built upon, for the formation of two basins for harbouring ships.

If we now add together the works along the shores of the main stream, the canal, and round the three harbour basins, we obtain a total length of 47,414 mètres (51,854 yards, or 29½ English miles), with an area of 315 Austrian jochs (181·27 hectares, or 448 acres).

Five bridges, of stone and iron, serve for the uninterrupted communication, in the first place, with the flat country on the opposite shore, and, next, with the northern parts of the Austrian Empire. Massively and artistically built, they are an architectural ornament of Vienna. Three of them are railway bridges, belonging respectively to the State, North, and North-West Railways; while between them one, the beautiful Franz Joseph Bridge, has been erected at a cost of 260,000*l.*, near the old Tabor; and a second, the Reichsstrassen Bridge, in the direction of the Praterstrasse and Schwimmschul-Allee, for direct communication with the fertile Marchfeld, is nearly completed.

Thus the great question of the commercial development of Vienna is thought to have been satisfactorily solved. The new city will arise on a regulated river, no longer exposed to destructive inundations. Great hopes have been raised by this undertaking. Provided with safe and numerous means of communication by land and by water, the "Kaiserstadt" will gradually but steadily go on increasing both from commercial and industrial points of view. One good effect has already been felt; Vienna is no longer subjected to the periodical inundations which brought misery and disease in their train. Everything done since the extension and improvement of Vienna to make the city—already favoured by its situation—by the hand of man a jewel among Continental capitals, finds in the regulation of the Danube its crowning point. The great work will remain a lasting monument to the reign of the Emperor Francis Joseph.

* See *Builder*, 1873, vol. xxxi.

BURMESE HOUSES.

As Burmah may perhaps become a battle-ground between China and our Indian empire, a few particulars concerning its domestic architecture may be acceptable. Among the many tribes in this immense district the Karens occupy the most prominent position, and being a representative race, have a superior claim to notice.

The dwellings of the natives are constructed of timbers set in the earth, with lighter pieces fastened transversely. The frames so formed are never set on stone or brick pillars. The sides are covered with mats or with thatch, which is fastened down with laths of rattan. Thatch is the usual covering for the roof, and is fastened on so ingeniously as to defy both wind and rain. One kind of thatch is composed of strong grass, about 7 ft. long, bent over a thin strip of cane, 4 ft. long, and stitched on with rattan; but a better sort of thatch is furnished by the large leaves of the attap or dennee trees, which are laid on like wide boards, lapping over each other, in the manner of tiles, from 12 in. to 18 in.

The floors are constructed of split cane, raised a few feet from the earth, whereby ventilation and cleanliness are secured; but the open crevices between the slots often invite carelessness by suffering garbage and foul fluids to pass through, so that, among the lower ranks, the space under the building is a muck-midden,

swarming with vermin. The doors and windows are of mat, strengthened with a bamboo frame, fastened at the top. Chimneys there are none. The whole house can be constructed in from two to three days, at a cost of from 60 to 100 rupees. The houses of the wealthy, in large towns, are constructed of wood, with plank floors and panelled doors and window-shutters, but neither lath, plaster, nor glass is employed in their construction.

These houses, with all their capabilities of shade and ventilation, are not without their disadvantages. They afford a refuge for spiders, centipedes, and other vermin. The centipedes are poisonous, but the effects of their bite last only for a few days.

On the architecture of the dwellings of the upper classes much attention is bestowed, and the architects and builders, if they deviated from the conventional rule, would be severely punished. These buildings are distinguished from those of the lower classes by the hips or stages in the roof, as in the case of the Zayats. Zayats are not exclusively religious buildings. Some, indeed, do contain idols; but the majority are intended for the resting-places of travellers, an inestimable boon in a country not possessed of inns, and where every house contains its complete complement of inmates. All of them are built in a far more durable and expensive style than even the residences of the wealthy. Many of them in the neighbourhood of the large cities are exceedingly beautiful. Not only are the pillars and the ceilings carved in an elaborate manner, but they are also gilded all over; and the floors, though constructed only of stucco, possess a hardness and polish equal to marble. But to judge rightly of the architectural skill of the Burmese, attention must be directed to their temples, which are truly magnificent. If the people were permitted, they would erect for themselves substantial buildings of stone or brick. Lieutenant-Colonel Symes, in his "Embassy to the Kingdom of Ava in 1795," says, notwithstanding that well-formed arches of brick are still to be seen in many of the ancient temples, yet Birman workmen can no longer turn them"; but Malcom, who followed in his footsteps nearly half a century after, writes,—"I have seen many fine arches of large span evidently erected within a few years, and some not yet finished, constructed wholly by Burman masons." The stucco which covers every building is put on in a tasteful and durable manner; it is also, as already mentioned, used for flooring. The mortar is compounded of the best lime and sand, with a liberal mixture of jaggery (dark, coarse sugar, made of the juice of palms), but no hair is used. It is, however, round the City of Ava, or one of the ancient seats of government, that the finest samples of Burman architecture must be looked for. There the religious structures abound and excel in magnificence those in distant parts of the empire. The Burmans have not expended all their zeal on temples and pagodas, they have constructed tanks and other works of irrigation, and also bridges, all of which are grand and noble works. Malcom, speaking of a bridge at Mokesobo, states: "Across the little river at Ava, and the marsh adjacent, is a very long bridge, which I have not seen surpassed in India, and scarcely in Europe." There is, however, another side to the picture. The Bghai Tribes are perhaps the most savage in the empire. Each village is independent of every other village, and of all other communities, the chief being a king in his little territory, and each village has feuds with other villages, so that predatory warfare prevails incessantly. Each village consists of a single house, or at most two, built like a bazaar or arcade, with rooms on each side of the walks that pass through the building. Its size is estimated by the number of hearths it contains, every family possessing its own hearth. Some villages contain from seventy to eighty of these hearths. The houses are raised high above the ground, and in the space underneath are rows of pig-styes, and on the rafters above the fowls roost at their own sweet will. Luckily for the villages their olfactory nerves are in no way disturbed by this arrangement. The compound is usually enclosed by a high fence, some by a *chevaux de frise*, of pointed bamboos, and some by traps and pitfalls, and so any stranger visiting the village would require to be conducted by one of its inhabitants. With all these precautions many of the villagers live in such perpetual terror of their enemies that all the men sleep out of their house on the ground in order to repel a sudden attack, while the only access to the house is from a trap-door in the centre, at which a ladder is placed during the day. Each village or house is practically a fortress. It is a general practice for each village to build a new house annually, selecting a site as near as practical to cultivation. On the first occupation of the new house, a feast equivalent to a "house-warming," is made, and an ox or buffalo is killed, and an offering is prepared for the spirits that preside over the country. When all are seated around the food and drink, each one takes a draught of the spirituous or fermented liquors, and offers up a prayer to the Lord of the Waters, Lord of the Streams, of the Mountains, of the Hills, &c., to bless them and their village, and to curse their enemies. Such is the method of house-warming among a numerous race, which though within the confines of British rule, have for many years been unknown to the missionary or the traveller.

DECORATIONS, BANK HALL, CHAPEL-EN-LE-FRITH.

THERE has been on view during the past week in the upper room of the French Gallery, in Old Bond-street, a series of pictures designed, and for the most part painted, by Mr. Thomas Armstrong, for the decoration of the dining-room of a house at Chapel-en-le-Frith, Derbyshire, lately erected for Mr. Renshaw from the designs of Mr. W. Eden Nesfield. These pictures are upon canvas, and are painted in oil with zinc white. The method employed gives the painting a dead unreflecting surface, somewhat resembling fresco, but more luminous from the texture of the canvas presenting innumerable minute prominences to the light.

The conditions under which the pictures are seen at the French Gallery are not very favourable: the room in which they are exhibited is lighted from above, although it is evident from the manner in which the painting is executed, the lower portions being more carefully finished than the upper part, that they are intended for a room lighted from the side or end; while the want of some sketch of the room they are designed to decorate renders it a matter of some uncertainty to judge of the painter's intentions to their full, as well as of conceiving the difficulties attending the task imposed upon him.

The paintings exhibited are six in number, and are surrounded by a deep moulded margin of light oak; three of the panels are grouped together in one frame, and are apparently intended to occupy one of the longer sides of the room; two others appear intended to be placed on each side of the fireplace, and the sixth (which is much smaller than the others) is probably designed to go over a doorway. The main feature of the design is a high panelled dado of coloured marble, which is continued through the whole of the pictures, varying to some extent in design in each division, but forming a continuous band by which the whole composition is held together. In front of this dado, which is treated in a strictly architectural sense, and almost touching it, are placed the figures and animals composing the several groups, the upper part of the picture being filled in, in the case of the figure subjects, with an orange grove treated conventionally, through which occasionally are seen glimpses of distance; in the animal subjects, the background of one is formed by a *magnolia grandiflora* trained against a wall, and in the other by an open sky.

The artist has evidently aimed at producing the greatest amount of repose: there is only just sufficient incident in the composition to attract the mind without fatiguing it, the figures are represented in arrested or very gentle action, and a general impression of refinement and serenity is produced by the combined effect of the grouping and colouring, employed. The grouping is extremely simple and unaffected, and the colour, which is in a low key, the effect of which is increased by the method of painting, is remarkable for the self-restraint by which all crude and obvious contrasts have been avoided, and the patient way in which effects are produced by very subtle variations of tint. The detaching the light draperies of the figures from the marble background upon which they are relieved is of itself a remarkable feat, and has been accomplished without any apparent effort on the part of the painter.

We do not know to what extent the architect assisted in the choice and arrangement of these paintings, but it is noteworthy that their whole disposition is of an architectural character, and they are distinctly subordinated to the decoration of the room, instead of being treated (as is too often the case) as if they were pictures hung upon the walls. The treatment throughout is decorative rather than pictorial, and, to whatever influence it is to be ascribed, it is creditable at once to the judgment and self-restraint of the artist, the opposite method being the most popular with the generality of people and the most calculated to win the applause of the unthinking.

The animal subjects, with the exception of the kitten in one of the figure panels, and a group of wild ducks alighting, very charmingly composed, have been painted by Mr. R. Caldecott, in a way which harmonises with the general tone and intention of the decoration. A group of two swans pluming themselves after emerging from the water upon the steps of a terrace, and the companion group, of a stork by the side of an oleander, watched by a magpie, show a very unusual observation of the character of animals, and are painted in a very refined and unobtrusive manner.

THE BURSTING OF BATH AND KITCHEN BOILERS.

IN the paper on this subject read by Mr. Councillor W. H. Bailey, Salford, as elsewhere mentioned, before the Society of Municipal and Sanitary Engineers, at their recent meeting in the Town Hall, Manchester, the reader said,—

Every winter in this country there are many fatal accidents caused by the explosion of what are known as circulating or bath boilers; there is also a great amount of damage done to house property, and some domestic misery created by the bursting of water pipes, caused by the water freezing in them.

There seems to be among many people an impression that domestic boilers often explode through a deficient water supply. I believe this is not the case, and I think it will be very difficult indeed to demonstrate that any accidents have occured through this cause. A great number of boilers burst every year which are unreported, because not attended with fatal results. Of those which have been reported during the past six or seven years, half appear to have exploded through stoppage of the circulating pipes by ice, and the remaining half have been caused by the fixing of stop-taps in those pipes.

A few years ago circulating boilers were only in existence in comparatively few large houses and hotels, but now nearly all new houses of the value of 20*l.* per annum or more built in this country have bath boilers, and, unfortunately, the great majority are of cast iron, of the very worst form for resisting pressure. There are two slightly different modes of fixing these in this district, which I will endeavour to describe.

In one, the supply of cold water is received in a cistern at the top of the house, and conducted by the "down-pipe" into the boiler; having passed through this, and having become hot, and therefore of less specific gravity, it ascends what is called the "up-pipe" to the hot-water cistern, from which it is drawn as required for use.

It will be seen that the pressure the boiler has to sustain when filled with water depends upon the height of the supply cistern above it; 2 ft. 3 in. of water in column being equal to a pressure of 1 lb. on the square inch, therefore 60 ft. high will give a pressure of 17 lb. per square inch on the boiler. As, however, most boilers are only about 30 ft. or 40 ft. below the cistern, we may consider that the average pressure at which they work will be about 10 lb. on the square inch.

In good houses in this district copper cylinders are fixed in connexion with the boiler, in order to give an abundant supply of hot water, and for preventing and rendering explosions impossible; that is, if we are to believe what is told us by more than one respectable tradesman of this district. In the second arrangement the hot water cylinder is used. It differs slightly from the plan I have already described, the hot water cistern being dispensed with, and a large cylinder, generally of copper, being placed in the up pipe instead. A pipe is taken from the top of this cylinder, called the air-pipe, which is open to the atmosphere, and in which water ascends to the level of the cold-water supply cistern. The great advantage in using these cylinders is obvious, as [the constant circulation which is always taking place causes the water when cool to descend into the boiler, and, when hot, up again into the cylinder, absorbing all the heat possible for the boiler to give it, which is not the

case in the simpler and less expensive mode of fixing.

Sometimes the hot water is drawn from the top of the cylinder, and sometimes from the air-pipe. In both these systems of fixing it will be seen that the boilers are always full of water, and, supposing the supply of water to cease, it would not be possible to drain them dry, causing the fire to make them red-hot, and thus create danger. The source of danger and death is to be found in the direction to which I have alluded; and if there is one thing at all that creates astonishment in my mind, it is the fact that I stand here in this city of Manchester and state that it is unsafe to work a boiler under pressure which has not a safety-valve fitted to it.

With the best intentions many boilers have taps fitted in the up and down pipes, so that if any accident occurs to the boiler it may be repaired or removed without fear of inundation. These taps have caused many fatal accidents in summer as well as in winter. If these taps are by any means closed when the boiler is at work, the water is sealed in the boiler, and nothing can prevent pressure accumulating unless the fire be put out. Only a few days ago I talked the matter over with an architect of no mean reputation in this district, who informed me that he would not think of permitting a good house to be fitted with a boiler which had not these taps fixed. He had ordered several houses to be fitted with taps under the copper cylinders. I am glad to say he altered his opinion when I explained to him the facility which he gave to ignorant or careless people for creating a magazine of destruction.

The fixing of these stop-taps caused the death of a young woman in January of this year. This is known as the Eccles New-road accident. As it occurred in my own neighbourhood, and in Seedley Ward,—which I have the honour to represent in the Town Council of Salford,—I took more than an ordinary interest in it. I was the foreman of the jury convened to inquire into the cause of death. It appeared that the proprietor of the house, actuated by a proper desire to make his house safe from inundation, consulted a plumber, who informed him that the best way was to fix two taps, one in the up-pipe and one in the down-pipe of the bath boiler. These were placed in the bathroom immediately under the cisterns, the boiler not having a copper cylinder; they were fixed where any mischievous lad could have turned them at any time. A leakage, during the thaw, of entirely different pipes, caused the proprietor to turn these taps off, and having done this he ordered the fire out. A plumber was sent for, and told to make all right; the leaking pipe was soldered, he reported all correct, but omitted to turn the taps on again. The result was that an explosion took place, which removed the ranges of the house and the one next door, making a breach in the division wall sufficiently large for any one to walk through. The window was blown out, and the poor woman was blown halfway through it.

I will now proceed to those accidents caused through the stoppage of the circulation by the freezing of the water in the pipes. These accidents appear to occur chiefly when houses are entered upon by the tenants in the winter time, everything being cold, the water in the pipes being frozen. A fire is put under the boiler by the new tenant, and an explosion takes place. In very severe weather pipes have been known to accumulate ice in one night, those boilers fixed without copper cylinders being most dangerous. Not far from the scene of the Eccles New-road accident, about two years ago, a Mrs. Cowie was killed by an explosion from this cause. The water in the boiler had longer time than usual to cool on the Saturday night, and Mrs. Cowie having got up late on the Sunday morning, after the fire had been lighted a short time, the boiler burst, and she was blown across the kitchen and down the cellar steps and killed.

Having endeavoured to show the two chief causes of these explosions, the natural question is, what is the remedy? what will prevent this destruction of life and property? I have no hesitation in saying that if safety-valves had been fixed that every one of the accidents would have been prevented. And as the ordinary lever safety-valve would possibly become inoperative in course of time, a little pendulous safety-valve, of the Cowburn type, has been recommended, as not likely to get out of order, by Mr. Fletcher, of the Steam Users' Association; and if safety-valves were fixed on the boiler, I think there is no objection to the use of taps in the circulating pipes, as they are undoubtedly useful in case of accident. Weak plates of white metal have been recommended instead of safety-valves, which would burst at a low pressure. I have made extensive experiments on these plates, and have burst a great number by actual steam-pressure; but I found that I never could get two alike out of the same mixture of metal. There are also many other objections to them which I will not occupy your time with.

A word about copper cylinders preventing explosions. Circulars have been issued by iron-mongers in which it is distinctly stated that these things render an explosion impossible. This delusion, which has such a firm hold in the minds of many people, demands some attention. A copper cylinder fixed to a boiler makes it safer from those explosions which are caused by ice in the pipes. It is just possible that the death of Mrs. Cowie, which was caused by the water freezing in one night, would have been prevented by one, as the hot water in the cylinder makes it a storage of heat, which resists the attacks of cold for a longer time than a small pipe full will do. A copper cylinder only delays the danger a few hours at most in severe winters, and its utility ends at that for preventing explosions.

GEMS AND GEM CUTTING.

THE MARLBOROUGH COLLECTION.

A WONDERFUL man is Mr. Agnew. "This magnificent collection of engraved and sculptured stones," said Mr. Woods in the rostrum the other day, "has been valued at 35,000*l.*, and that is the reserved price put upon it."

"What must be the bidding in advance?" says Mr. Agnew. "Guineas," replies Mr. Wood; "35,000*l.*, once!"

"Guineas," says Mr. Agnew. And after the ordinary formula down goes the hammer, and Mr. Agnew becomes the owner of the "gems" at 35,000 guineas, and sells them again, it is understood, the same afternoon, with probably his traditional 10 per cent. profit.

A careful examination of this magnificent collection of engraved and sculptured stones can hardly have done otherwise than call attention somewhat dismally, and, certainly, powerfully to the subject of gem cutting and designing as practised by the great artists of former and less enlightened days and our own. It is a subject which it would be very difficult indeed to exhaust; yet has it as yet excited, except among professionals and experts, but little interest. These objects are, it is true, looked at somewhat curiously and attentively and wonderingly, but more than that cannot be affirmed. But for all this there is nothing in fine art, and in its mode of production, more wonderful than a finely-cut gem; and nothing most surely evidencing the power of hand more exquisitely than the skill and power displayed in the cutting of it. A few thoughts, therefore, on gems, and on the special power displayed in the cutting of these adamantine stones, as exemplified in the "Marlborough Collection," may be of interest at the present moment.

In the whole range of art action there is nothing more surprising than the art, on so small a scale, of cutting into the substance of a hard fragment of stone. Not only, be it observed, is a clear and well-defined and absolutely correct outline of the "design" or subject to be accurately kept to, but the depths to which the stone is to be cut into are at the same time with equal accuracy to be observed, so as to get not only the outline of the object, whatever it may be, but the body or "round" of it as well. Not unfrequently the full half of a figure, say of the human form, is to be accurately and even expressively rendered, so that if two of these incised stones, of the same size, were to be placed together, and thus to form a mould, a perfect figure, in the round, would result on taking a wax or plaster impression from the matrix. We have been told that the highest triumph of human artistic skill and dexterity is to be found in fine oil-painting; and no doubt it is so, considering its extreme rarity in its full perfection. But it is hardly so surprising and marvellous as this art of fine gem-cutting. We need do no more than refer to a few of the specimens of gem-cutting in the Marlborough Collection, just now sold by auction for so large a sum, for proof of this, and would specially name those in which the human nude form was delineated, and not a little of the life and movement of the human body most admirably portrayed. And not this alone, but the very expression of the human countenance, small as it is, is most miraculously rendered.

It would be difficult to find, within the whole range of sculptured art, and it is a curious fact, so thorough an appreciation of the necessity of individuality of art power. The artist engravers would seem to have been proud of their work, and to have earnestly desired to be known as the executive *workmen* of their own work, as they so well deserved to be known,—none ever deserved recognition better than they. It is a pleasure to record some of the names. These gems, as it has well been said, form a complete encyclopædia of glyptic art, invaluable as a book of reference to students of art and history, and the writer might well have added, and as affording and perpetuating a goodly list of noble names of illustrious and right skilful working artists. The artist must in such case be personally gifted indeed with thought and feeling; and must have trained both his hand and eye to most marvellous exactness, and have acquired mastery over the most unyielding and resisting of materials. Many of the artists named by Pliny are here to be found named on gems; one of these an onyx intaglio, purchased by a former Duke of Devonshire, for 1,000 guineas. On this is simply represented a cow lying down, but it bears the letters ΑΠΟΛΛΟΝΙΔΟΥ, Apollonides, one of the best of these clever working men. Another gem bears the name of Hyllos; another, a beautiful sardonyx-cameo, has the name of Glycon; again, another, a carbuncle, measuring 1¾ in. by 1¼ in. oval in form, ¾ in. thick, with a figure of Pallas, bears the inscription, "Eulyches Ægeai, of Dioscorides, *fecit*," a truly wonderful production of the hand of man. It would be quite possible to go on and give a goodly catalogue of names, and it would seem to be worth while to do this exhaustively, arranging the names as far as is possible in chronological order,—a useful work for any devoted wholly and enthusiastically to art of this kind. It would, of course, add infinitely to its usefulness, and almost make an art history of it, to refer in each case to the collection in which the works of each master now are. We know but little or nothing of the personality or *names* of those who so ably and so well cut the ornamental details in the walls of our cathedrals and churches all over Europe: more is the pity, but here we *may* read historic names!

It will not be thought the least curious part of the inquiry, in connexion with these gems and gem engraving, to ponder for a moment on the question of the relative cost or value of the materials out of which this magnificent artistic work is done, and the cost or value of the art labour itself in them, which so adds to the beauty and value of the raw and formless material. In the first place, it may be mentioned,—and the fact is a somewhat singular one, and worth a little further inquiry by the scientific,—that the materials out of which gems are wrought, are not, as it would seem, nowadays to be come at of the same quality and fineness as in former and less advanced and scientific days. The older gems, whether of antique or Renaissance times, are as mere fragments of nature-formed materials, of much rarer and more refined quality than that to be now obtained, and the latter is not so well fitted, therefore, for the special purpose for which it is used. We say, a strange fact this; for why should it be so? One single mine of gem-producing fame may be exhausted of its best stones, it is true, and then another, but surely there is no end of the earth's pro- ducing powers. All the diamonds, and jacintha, and emeralds, and carbuncles, are not as yet surely in the world's market? Science digs deeper and deeper into the earth day by day, and more is known, one would suppose, now than at any former time, of the best places wherein to dig, and how best to search for the precious fragments than at any former time, when neither geology, mineralogy, nor chemistry had existence. Knowledge is, and must be, judged of by its results, and, according to Bacon, by its practical "fruit." Why, then, does it fail here? We are almost inclined to hazard an answer to this puzzling question, venturesome as it is. May not a good deal be owing to the very power of machinery itself? Is not too much left in these days to the dead mechanism even here in the mere searching for precious fragments? Eye and hand both are needful in their fulness of power even here. Other causes there are doubtless, but this among them is worth scientific note.

We may next glance at the *labour* side of this gem question, and ask what proportion it bears in value to that of the most rare and precious material worked on, material from the far-famed

mines of Golconda or Pegu. Out of the substance of the dullest stone may the most marvellous of forms, and contours, and even life and action, within the compass of a sixpence, be wrought. We have but to look at the work of those whose names we have given to find this out, and to know then how the hand and intelligence of man can add to the beauty and interest and value of the unformed and rough material as dug out of the earth. No task can be more difficult than that of putting before any however skilful,—say a fine emerald or red ruby, or carbuncle, each so full of extremest beauty, and to demand that further increase of value be made to it. Such would seem an almost impossible problem, but it has here been solved most surely,—the skill of the workman has added not a little to the natural beauty of the material.

It is impossible, in looking through a collection of fine art work of this kind, to do otherwise than make comparisons, and to ask what is *now*, in these days of art-education, doing in this special line of work. We see in this collection, and in others elsewhere, examples of the brain and hand skill of the artists of past days,—both antique, to use that general term,—and of the Renaissance, or revival, more or less, of the older antique, and can but simply wonder at how they did their work so completely and so well. We can but wonder at what sort of tools they used, and long to see a little into their workshops, and to see them at their work. What sort of art education, again, did they go through? We can but speculate on these matters, and wonder more and more as we gaze on what they accomplished. We cannot, at the same time, do otherwise than contrast the state generally of the world,—say in Pliny's day,—with our own. How different the mechanical appliances for doing work of all kinds. No books, except for the very, very few. In art, wonderful to tell, no "precedent," as we have, from all the quarters of the globe, and from all times. All things, indeed, would seem to have been reversed. What we have, *they* had not; but, with all their wants, what wonders they accomplished; and what should we do without them and without what they have left us to study? This gem-engraving shows what the antique man could do. What we now do can be best seen in the shop-windows, the true and ever-open museums, the modern museums of a nation. Might there not be some interest, we would ask, in an exhibition of the gem-cutting and invention of the men now living, and at work as gem *engravers* and cameo sculptors? The Art Union of London, always to the fore in such matters, though this is little recognised, has endeavoured on several occasions to aid the production of finely-worked gems in England, but with only moderate results.

Before ending these few remarks on so fruitful and suggestive an artistic subject, we would express a hope that these noble examples of fine-art skill, of brains and hands, may be further available to the art-loving portion of the public. The nation ought to possess this magnificent collection. And while upon this phase of the matter may we hint, too, at the desirability of a somewhat better mode of exhibiting gems than that usually adopted, as at the British Museum, wherein the specimens of engraved and sculptured stones, small as they are, are exhibited in deep close cases or boxes, with, of course, glass covers, but with the gems so far from the eye of the spectator as to render it impossible to see clearly objects with details so small, and impossible to apply to them a magnifying glass which is so often needed. Cases should be specially contrived for these things, so that the gem may be seen as closely as may be, and always by the side of it there should be an impression in wax or otherwise of the incised subject. These are small things, it is true; but not the less noteworthy and instructive on that account, and they read to us moderns a most wonderful and important lesson, difficult as it is to appreciate fully the import of things artistic. The true, and the more than doubtful in art action is here in a most striking and singular way exemplified. Those antique men who thus wrought on the rough materials Nature gives for the searching for, must have been as proud of their work as the ode-writers themselves were of theirs. Poets at least do not hide *themselves*, why should the gem-cutters?

Hastings.—The third premium for the Town-hall plans (St. Michael) falls to Messrs. Lee & Smith, of Gresham-buildings, London.

ON BUILDING IN CONCRETE.*

THE next point to be considered is the apparatus, or the mechanical means employed, to cause the concrete to take the required forms of walls and other parts of the building to be constructed.

There are two distinct methods employed in the use of concrete for buildings,—the "concrete brick" or "block system" and the *monolithic concrete* system.

By the first method the concrete is made to take the form of bricks or blocks, by being placed, when mixed, into small moulds, and afterwards, when sufficiently hard, these concrete bricks are set into their places in walls, &c., with mortar or cement joints, by skilled workmen, with similar scaffolding plant and expenses precisely as for brick work or stone work.

By the second or monolithic method the concrete, on being mixed, is placed and moulded at once into its permanent position.

No time is wasted in waiting till concrete bricks are strong enough to build. No expensive bricksetting is required, all the wall-building work being done by unskilled labourers, and mortar joints are avoided.

The avoidance of mortar joints is a great gain in strength.

One writer in favour of the concrete block system claims, in his list of advantages of concrete building (amongst many other advantages that can only be secured by monolithic concrete), the avoidance of dust caused by bad mortar joints. Surely the block system has no such advantage. The same writer pleaded in favour of concrete bricks that they give time for testing the cement. But where is the advantage in this? because, as I have already shown, there is ample time for testing before using the cement in building; and a prudent builder would not risk wasting money or time by using doubtful cement in making concrete bricks any more than he would do so in building monolithic walls.

If, however, bad cement were supplied by the maker, and the builder's preliminary tests failed to detect it, there would be yet an important safeguard in using the patent apparatus, now so generally employed for building monolithic walls.

The newly-built walls have not only to carry the apparatus, which is raised from time to time as the walls are built, but have also to carry the scaffolds with men and materials. None but good cement can resist the strain thus applied, and walls successfully resisting this strain when only a few days old may be relied upon to resist any strains that can be put upon them after, when their strength is so much increased.

There are very few districts where concrete block building can be done so cheaply as ordinary brickwork, and in many places where block building would cost more than brickwork or stonework, monolithic concrete would cost much less. In fact, monolithic concrete building has such decided advantages over concrete block building that no amount of special pleading in favour of blocks will deprive the monolithic system of its due ascendency and present well-deserved preference.

It is next important to consider which is the best system of apparatus to be employed to secure all the advantages of monolithic concrete buildings. Wooden posts and boards for building monolithic walls have been used in all times, and in all countries. But only very small and unimportant buildings can be constructed with such apparatus, and the work produced is very inferior, crooked, and uneven, making interior plastering or exterior finishing more than ordinarily expensive. With nearly all the various modifications of wooden posts and boards, an independent scaffold has to be used, and the advantage of testing the walls as built is not secured.

Its cheapness in the first instance is, doubtless, the chief inducement to use wooden apparatus, but whatever is saved in first cost is very soon lost in extra labour spent in working clumsy, wooden contrivances in endeavouring to keep them in proper positions which (from the tendency of wood to twist and swell, and split with wet concrete on one side, and often a hot sun on the other side) it is impossible to do.

With the improvements in the manufacture of cement, commenced improvements in apparatus for building with it, the leading idea being, of course, to obtain a mould which could be moved up the walls stage by stage as these were built up.

A rather general delusion among would-be inventors of concrete building apparatus was that an apparatus could be made to slide up the face of the wall without being first detached from the guides or uprights, and many clever and complicated arrangements of gearing and spur wheels, and handles, for turning of screws working in the middle of the walls in the worm formed by them in the concrete that had set around them, were tried; but, of course, all failed completely.

The mould would not slide up except by carrying up the concrete wall with it, either in whole courses or broken, and the screws would not turn in the concrete till force enough was used to destroy the worm in which it was expected to turn. Therefore, the only workable apparatus were those which could be detached, and come directly away from the concrete when resetting of the mould was necessary. Then many attempts were made to counteract, or overcome the evils of twisting or swelling of wood, by various clever dispositions of it, and by framing it in various ways, and also by covering the wooden frames with zinc, tin, &c.

But none of these attempts succeeded completely, and were, besides, all hampered by more or less complicated fasteners, and by the use of the old-fashioned, time-wasting, easily worn-out bolt and nut.

The apparatus patented by myself in 1868 was the first in which the use of wood was entirely discarded. It is made entirely of iron. The fasteners are simple tapered pins, or rounded wedges, than which no fastener can work more easily. . . . .

Before offering any remarks of my own upon the subject of architectural treatment. I beg to premise that I have at various times read the opinions of architects upon the subject of concrete building generally, as published in reports of papers read, and discussions following, at various scientific and architectural societies.

Quotation might be given, but I must now proceed with the remarks I wish to offer on this subject of architectural treatment; and I propose to divide these under two heads:—1st, Constructional; 2nd, Artistic or Decorative Treatment.

The great adhesive and cohesive qualities of Portland cement, and its capacity for resisting enormous tensile and transverse strains, adapt it for use in such ways as no other material is capable of.

Corbelling, oriels, and similar works, to the extent even of impossibility in any other material, may be done easily and cheaply in concrete. Arches may be built having no lateral thrust. Upper floors, and flat, or arched roofs, may be cast in place, requiring little or no iron in their construction for very considerable spans. Whole staircases are cast in place, with only light iron trusses cast in the midst, so that no iron comes in sight or under the influence of heat in case of fire.

Chimneys with projecting breasts may begin on upper floors, being hung out from the wall without the need of any supporting work under. Indents, hollows, and flues, may be formed in any part of the work by simply inserting casings or cores in the apparatus to exclude the concrete from spaces required. I would remark here that it has been erroneously stated that chimney flues require brick or tile lining to prevent disintegration of concrete through heat.

I can assert positively that no such thing can occur in any ordinary flue. If particles of concrete have come away in any case it has been through loose and bad work, and not from any disintegration through heat.

Openings may be formed anywhere in the walls without requiring lintels, arches, or other support for the walls over; a 10 in. thick wall has been built to carry itself in this way over a 14 ft. opening. Surely a material possessing such structural capacities should suggest features for architectural treatment suitable to its capacities. From being monolithic a broad and massive treatment seems to be suggested, and the capacity of cement for being moulded into ornamental detail should be kept in view. For the majority of dwelling-houses in towns and cities no decorative finish is ever attempted, whatever the material used in their construction. Nothing can be more wretched-looking than the ordinary brick front of the poorer class houses. How much brighter and more wholesome these would appear if built in concrete with plain cemented fronts. But

* See p. 601, *ante*.

hitherto the cemented front has been reserved for our West-end squares, and for such towns as Brighton, where ordinary brickwork requires cementing to ensure dry walls.

The face of concrete, as it is left by the mould, is so plain, crude, and evidently unfinished, that it must be taken to be a rule, that it must have a finishing coat of some kind. Unfortunately, the cementing I have already alluded to has in times past been applied to brick and stone walls, not in the manner of a legitimate and necessary protecting coat, but has been made the vehicle of deception, by giving to both brick and stone buildings an imitative appearance of a superior class of substantial stonework, and moreover the work has been done, in many instances, with bad materials, and also with bad, wasteful, and ignorant workmanship; so that, besides being a sham, it has become unsightly and unsound through cracking and peeling off, and in consequence an unreasonable prejudice exists against the application of a finishing coat of cement to the exterior surfaces of concrete buildings.

It appears not to be known or understood that the objections and causes of failure to which plastering or cementing of exteriors of brick or stone building is liable, do not exist in the case of cementing on concrete. A finishing coat of cement upon concrete is simply its natural and right treatment. Concrete gives such a good key for the cementing to grip and adhere to, that it practically forms part of the same mass, and concrete does not absorb and hold moisture to be acted upon by frost and heat, thus forcing off the plastering, as is the case with brickwork or stonework. The only liability to defects in cementing on concrete walls, is where two coats are used, and when idle and ignorant workmen, to save themselves trouble, use too large a proportion of cement for the thin finishing coat, then in consequence of the variation in the contraction of the two coats, the outer one is liable to show fine surface or (as they are often called) sun-cracks, and even in some cases to peel off. Of course this liability being known can be easily provided against.

It is considered by many architects and scientific men, whose knowledge and judgment on this point are far superior to my own, that nothing more is wanted in addition to what is done, for instance, in the case of the block of houses built by my firm at the corner of Marlborough-place, Brighton, than the introduction of colour, either by building in terra-cotta or tiles, or by the use of coloured cement similar to that called "Frescoa," which should be used to a limited extent only, and according to right artistic design.

A very good effect is produced in certain styles of building, by finishing mouldings around doors, windows, &c., in good sand-faced cementing, and giving the remaining spaces of panels a coat of clean fine shingle thrown upon a coat of cement while moist (my own house is finished in this way). This has also been applied in a more limited way to the most artistically treated building yet erected in concrete: I refer to "Down Hall," the mansion of Sir H. Selwin-Ibbetson, Mr. F. Cockerell being the architect. The flat spaces are divided geometrically by bands of sand-faced cementing, the panels being shingled as before described. But the most important feature is in the panels of "sgraffito" work, to which I am anxious to call your attention.

Some brickwork architects, not satisfied with the advantages they have in colour, cause their brickwork to take the forms of plain, moulded, or blocked quoins, or of moulded strings and architraves. I leave to others more learned in architecture to say whether block quoins, &c., are legitimate treatment for brickwork, but surely very few will deny that running mouldings in brickwork are most hideous and unsatisfactory, or that running mouldings in cement are very much superior.

Stonework is much more liable to disfiguration by change of colour. No such discolouration occurs with good cement work, which never requires scraping, pointing, &c., as does stonework and brickwork. Nor does it require painting or colouring as is supposed by some, and as it is done in too many cases to hide and protect the usual wretched plastered brickwork. Some have proposed to face concrete walls with brickwork or stonework; but I trust such shams as these will never meet with much support.

It has also been suggested to cover the whole exterior surface of concrete walls with encaustic tiles, and doubtless very effective decorative results may be obtained in this way; but I presume the cost and bad effect of glazed surfaces will prevent the adoption of this proposal.

My hope is that architects will learn to appreciate the full value of cement both as a constructive and decorative material, for in this direction lies the only legitimate treatment of concrete buildings, and here will be found a wider and more fruitful field for both structural and æsthetic result than has yet been found or dreamt of.

I will conclude by repeating a statement made in a letter of mine published in the *Builder* of May last year:—

"I am fully persuaded that concrete building is capable of high and legitimate treatment whenever architects of ability take it in hand. The subject demands and deserves a treatment more carefully considered and more vigorous than any it has yet received."

THE DOMESDAY-BOOK AND ANCIENT DEEDS.

A MODERN fac-simile reproduction of the Domesday-book has recently been finished under the superintendence of Sir Henry James, the Surveyor-General of the Ordnance, and a translation of the record is now being made under the authority of the Government.

The Domesday-book as reproduced is in two volumes, containing 1,663 pages, and is an exact fac-simile of the original documents, by means of the art of "photozincography," invented by Sir Henry James in 1860. The work forms a most valuable addition to the published histories of the kingdom, and its reception has fully justified the foresight of the Government, which allowed its publication to be commenced some twelve years ago by the production of the part relating to the county of Cornwall.

This portion is now being translated and republished in English, and will probably be followed by the translation of the other parts, or, at any rate, of those portions which have not already been so treated by various authors. Altogether the parts relating to eighteen counties have been already translated and published by different persons.

The completion of this fac-simile of the Domesday-book has been so successful that the Government has authorised the preparation, by the same method, of copies of the most interesting among our national records, which will not only make generally public the information, as it has been handed down to us, respecting important historical facts, but—the documents being arranged in chronological order—will show the changes which have been made in our language and our writing during the lapse of time.

A series of manuscripts has accordingly been copied, commencing with the Charter of London by the Conqueror, and ending with the despatch of Marlborough reporting the victory of Blenheim.

Scotch and Irish history have not been forgotten: some charters and important State papers relating principally to Scotland were next selected, and reproduced by this method; and a series of Irish manuscripts are now in course of being copied.

Even here this important work will not be ended. The Government have the intention of publishing a series of documents commencing with the earliest Anglo-Saxon records; and Sir Henry James has issued a copy of a charter of King Edgar, dated A.D. 974,—just 900 years old last year. This charter is the grant of three "manses," or plots of ground to Thane Alfhere, and is written partly in Latin and partly in Saxon. The writing is well preserved, and somewhat resembles the manuscript imitation of the ordinary type of the present day.

Altogether the Survey Department of the Government has a very important work in hand, the completion of which will add greatly to the general knowledge of the ancient history of our country.

It is satisfactory to learn that this work is remunerative, or, at least, self-supporting, and that the sales of the works published cover the primary expense of execution.

A New Lunatic Asylum for Surrey.—In consequence of the great increase in the number of pauper lunatics, the Surrey magistrates have decided on the erection of a new asylum for 1,000 patients.

THE ASSESSMENT OF SEWERS RATES IN THE METROPOLIS.

BY section 163 of the Metropolis Local Management Act, 1855, sewers rates levied on land used as arable, meadow, or pasture-ground, or as woodland, orchard, market-garden, hop, herb, flower, fruit, or nursery ground, are to be assessed in the proportion of one-fourth of the net annual value of such land; and other kinds of property are also exempt from sewers rate, or entitled to a reduction in the rate. It is the practice of the Metropolitan Board of Works, in issuing its "precepts" for money to the different parishes, to make no allowance in respect of property entitled to exemption or reduction; and those parts of the Metropolis in which such property is situated are obliged to increase the sewers rate in order to meet these "precepts," to make up for the deficiency in the rate levied upon the exempted lands. The practice has led to considerable confusion, and a certain amount of unfairness, and a Bill is in progress through Parliament making it compulsory on the overseers and assessment committees acting under the Valuation (Metropolis) Act, 1869, to cause the totals of the gross and rateable value of the property so wholly or partially exempt to be inserted in the valuation list, for next year and in all future years; and the "precepts" of the Metropolitan Board of Works are in future so to be estimated that all parts of London shall be uniformly rated in respect of sewers rate.

A MASONIC TEMPLE.

THE Freemasons of New York City have built themselves a grand temple. It stands at the corner of Twenty-third-street and Sixth-avenue, the main front being 114 ft. on the former street, and the depth about 92 ft. on the latter, while the surmounting dome rises to a height of 165 ft. above the pavement. It is a building of five stories, the fifth being a mansard roof which is surmounted by a high quadrangular dome, giving a pyramidal form to the structure. The cornice is 94 ft. above the pavement, and above this the mansard pavilions rise 30 ft. and the dome 41 ft. further. The exterior is designed in French Renaissance, each story representing a subordinate order, beginning with the Tuscan in the lower story, above which is the Ionic, then the Corinthian, and lastly the Composite. Light blue granite is used, this being combined in the Tuscan story with bands of grainy syenite of a darker hue. On the main front the building is divided perpendicularly into a central columned pavilion 50 ft. wide, in which the granite work extending through the mansard story is surmounted by the dome, on each side of which are curtains containing niches for statues. At each angle there are pavilions 26 ft. wide, these being repeated on the Sixth-avenue front. The first story is fitted up for stores, the chief part being occupied by a Safe Deposit and Trust Company. The main entrance is in Twenty-third-street, and is approached through an elaborate Tuscan portico. Here stand the emblematical pillars, and between them the visitor enters into a large vestibule lined with parti-coloured marbles. Bronze sphinxes guard the stairway which ascends to the main corridor on the second story, which is decorated in the Ionic order, and is 20 ft. by 66 ft., and 28 ft. high. On one side of this corridor are the apartments of the grand officers, and on the other side the Grand Lodge-room. Over the central entrance, imbedded in the wall, is a piece of ashlar vouched for as having formed part of the foundation of Solomon's Temple at Jerusalem. The Grand Lodge-room is 85 ft. by 92 ft., and 28 ft. high, and will seat 1,000 persons. Its architecture is festooned Roman Ionic, a double row of columns running through it, these being a constructive necessity from the weight of the building above. The third and fourth stories are divided into smaller apartments. Each story contains a reception parlour, 20 ft. by 60 ft., opening into the Lodge-rooms. The Lodge-rooms on the third floor are the Tuscan-room, 27 ft. by 62 ft.; the Doric-room, 30 ft. by 62 ft.; the Ionic-room, 26 ft. 6in. by 63 ft.; and the Livingston-room, 21 ft. by 47 ft. These are surmounted on the fourth floor by apartments of similar size,—the Composite-room, the Corinthian-room, the Egyptian-room, and the Clinton-room. Of these, the Doric-room is upholstered in crimson; the Ionic-room in blue; and the Composite-room in orange. Seven of these apartments are Master Masons' Lodge-rooms, while the Egyptian-room is designed for the meeting of the Royal Arch

Chapters. The top story is to be used by the Knights Templar and Ancient and Accepted Rite, and is constructed for an asylum 41 ft. by 78 ft., and 21 ft. high, a council chamber, 21 ft. by 35 ft., and the other apartments necessary to these high Masonic degrees. The asylum is Gothic, and the council-chamber Saracenic. There is also a banquet-hall in Norman style, 27 ft. 6 in. by 55 ft., and an armoury containing 650 closets for the knights' equipments. Masonry is in the ascendant.

HOW NOT TO DO IT AT HONITON.

A QUARTERLY meeting of the Town Council was held last week, principally to consider the sanitary state of the borough, and to receive a report from Mr. J. Martin, C.E., in reply to instructions given by the General Purposes Committee.

Mr. Martin presented a voluminous and well-prepared report, entering fully into the sanitary state of the town; and, after pointing out its many serious defects, strongly advised the council to meet their difficulties at once by adopting a judicious water-supply, and replacing the old stone drains with glazed sanitary pipes, so as to ensure an efficient system of drainage.

Alderman Read then proposed "That a comprehensive scheme for the proper drainage of the town be at once prepared by Mr. Martin, and submitted to the council, and that the necessary funds to carry out the same be raised by a loan from Government, on the security of the rates, the repayment to spread over thirty years." He observed that it would be far better to meet the case boldly and decisively, than to go on as they had been for many years, simply spending every available sixpence, and yet making but trifling progress. Any unprejudiced person who would go over the town must say there was need of great reform, and, for his part, he was sick of the constant bringing up of the old story. He appealed to them to take the matter up at once.

The Mayor expressed a hope that the motion would receive the careful attention of the council, and observed that the report of the General Purposes Committee was honestly and carefully given, and not at all over-stated.

No other member of the council, however, supported the motion, which, consequently, was lost.

POLITICS BLENDED WITH RESTORATION OF CATHEDRALS.

SIR GILBERT SCOTT AND HIS CRITICS.

THE architect who has the fortune to be chosen to superintend the restoration of English cathedrals and churches has, in the present age, much unpleasant criticism to endure; but only up to the present time, it may be inferred, have politics been brought in to unsettle the plans of Sir Gilbert Scott.

A correspondent says,—From some inquiries and authentic sources, there is good reason to believe that the late paragraph in the *Times* charging the restorers of Durham Cathedral with intending to make alterations "utterly out of harmony with the massive grandeur of the building," is explained by the fact of the admitted writer of the paragraph being a strong antagonist to the Dean of Durham in politics, and who cannot forgive Dean Lake for his exertions at the late election for the city of Durham; for it now transpires that the writer to the *Times*, who is a member of the cathedral body, has all along been cognisant of Sir Gilbert Scott's plans, but until now he has not expressed the slightest disapproval of the "improvements" he so warmly denounces.

The Dean thus takes up the challenge for the architect and himself, and enters into some architectural criticism deserving attention:—

"The exaggerated statements with regard to the restoration of the cathedral, now in progress under Sir Gilbert Scott, are so full of inaccuracies that, though I seldom notice such attacks, I do so in the present instance lest the public should suppose that there is any ground for such an amount of misrepresentation.

I will take the opportunity of expressing my regret, in the first place, that the progress of the cathedral is necessarily slow. It was retarded, indeed, for nearly a year by the unanimous desire of the Chapter to obtain the services of Sir Gilbert Scott, then in Italy, as their architect, and this upon the ground that his experience was beyond that of any living architect in cathedrals, most of which he has restored, and that from his judgment and moderation he was certain to introduce nothing which would not be architecturally correct, and, if I may so express it, moderate and sensible.

It is needless to add that this fact shows at once how improbable it is that the design for our alterations should be open to the countless charges of 'jumble of architectural incongruities,' 'mongrel fane,' 'sickly sentimentalism,' and 'creeping approaches to Ritualism or Romanism,' which are applied to the Dean and Chapter, and to one of the first architects of the day.

And, with regard to any appearance of delay in the work, I will only add that all cathedral restoration is liable to take a longer time than was expected, and that anxious as I am to hasten the work, I shall beg our friends not to be impatient, if only on the ground that never have the services of the cathedral been more hearty, popular, and well attended, than they are now in the nave.

I find the attack to be not on one thing alone, but on every single point in Sir Gilbert Scott's plan, even down to an indignant protest that the old communion-rails, which, as every one knows, had become very unsightly, are to be replaced by a 'huge brass bar,' and the conclusion is, that the 'Norman Temple' is to become a 'jumble of architectural incongruities.' Now it may be as well to state what the alterations proposed are, viz.:—a very fine mosaic,—not, as is absurdly stated, a 'variegated pavement in the style of the Italian Renaissance'; the advance of the stalls, which every architect would pronounce an architectural necessity, and by which we lose nothing except the curious boxes in which the ladies used to sit under the canopies of the canons; a pulpit to be placed in the nave, which will be one of the finest in England, and whose massive character will harmonise well with the whole building; and an open screen of three arches only, which will interpose no real obstruction to the view from one end of the cathedral to the other."

"There is, indeed, one change, and one only, as I venture to think, fairly open to temperate criticism; I mean the introduction of a screen. No one would more object to a screen than I should have done myself, if it had implied any division between the nave and the chancel other than is marked by the mere fact that they are distinct parts of the church, or if it would have interposed any bar between one part of the congregation and the other. But the proposed screen will be little or no bar at all, and I believe there is no point on which architects are more agreed than that a break in the long continuous vista of our cathedral will, instead of diminishing, increase its grandeur. I have never spoken with any eminent architect who has not assured me that the effect of Durham would be much increased by a screen. However, I am well aware that the question is one on which persons may reasonably differ; and I may frankly say that on this point my own opinion, and that of the Chapter, was mainly influenced by the very strong conviction of Sir Gilbert Scott that 'no cathedral suffered so much from the want of a screen as Durham.'

The writer to the papers, however, regards a screen almost wholly as a badge of 'sacerdotalism,' an insinuation which, in view of the fact that a screen is a distinctive feature of nearly all English cathedrals, is simply laughable."

THE MIDLAND RAILWAY COMPANY'S NEW COAL DEPÔT AT BRIXTON.

WITHIN the last fortnight the Midland Railway Company have commenced the erection of another large coal depôt at Brixton, on land immediately adjoining the Metropolitan Extension line of the London, Chatham, and Dover Company, and situate between that company's line and the South London section of the London and Brighton line. This makes the third spacious depôt of this character which the Midland Company have constructed alongside the stations of the Metropolitan Extension line, they having already large establishments of the kind at Walworth and at Wandsworth, the former of which is now being enlarged to nearly double its present area.

The Brixton depôt, which will be immediately in front of the Brixton Station, and approached at the west end from Atlantic-road, and at the east from Canterbury-road, is being erected on strong wooden piles, 14 in. square and 18 ft. in height, from the ground to the railway level above. These piles, fifty in number, rest upon a concrete foundation, 2 ft. in thickness, above which is a base of brick, 4 ft. in depth. The wooden piles are strengthened and tied together by strong cross-girders and iron rods. The railway level of the depôt has five lines of rails, forming that number of bays for the wagons containing the coal. These bays are 150 ft. in length, with an aggregate width of 100 ft.; in addition to which there are two traversing lines diverging from the London, Chatham, and Dover line, near Canterbury-road, by means of which the coal-wagons reach the depôt. At each end of the bays the depôt extends about 50 ft. in length, supported by strong iron columns and girders; and in front of this space, at each end, there are upwards of twenty shoots, by which the coal will be conveyed into the carts on the ground level from the depôt above. The entire area of the depôt is nearly two acres in extent.

The contractors for the structure are Messrs. Wall, Brothers, of Kentish-town, and the estimated cost is about 20,000*l*.

The Livingstone Monument. — Models were sent in by three artists chosen to compete. The selection of the committee has fallen upon the model sent in by Mr. John Mossman, Glasgow. The hon. secretary has forwarded to each of the unsuccessful competitors an honorarium of 50*l*., as had been previously agreed upon.

THE ALBERT MEMORIAL CHAPEL, WINDSOR.

WITH the gracious permission of her Majesty the Queen, we give in our present issue a view of the interior of the Albert Memorial Chapel, adjoining St. George's Chapel, Windsor Castle. The view represents the chapel as seen looking east, with the cenotaph of his Royal Highness the late Prince Consort. Mosaics fill the inter-spaces of the groined vaultings, stained glass glorifies the windows; the wall-spaces under the windows are filled with subjects in inlaid marble, and the floor is paved with a mosaic of coloured marbles. The works have been going on for about ten years, under the direction of Sir G. G. Scott, as architect, and the result is unique not alone in this country.

We have already published an account of the works, with the names of the executants,* but will briefly recapitulate that the mosaic work has been produced by Dr. Salviati, from cartoons by Messrs. Clayton & Bell, who also executed all the stained glass. The marble work on the walls, and the cenotaph, including the recumbent figure of the Prince in armour, are the work of the late Baron de Triqueti, as is also the sculpture of the reredos, which represents the Resurrection.

NEW INDUSTRIAL DWELLINGS IN NEWINGTON.

RESTRICTIONS BY THE METROPOLITAN BOARD.

A BLOCK of industrial dwellings are about to be erected by Messrs. Sutton & Dudley in Pollock-road, Newington, who a short time ago applied to the Metropolitan Board of Works to sanction their plans, according to which the buildings were to be 60 ft. in height, but the Building Committee declined to give their sanction to their being carried to that height, and the proprietors have in consequence modified their plans. At the meeting of the Metropolitan Board last week amended plans were submitted, the height of the proposed buildings being limited to 51 ft. 9 in.; and the building committee recommended that these plans be sanctioned, the building to be constructed with a flat roof, so as to interfere as little as possible with access of light and air to the street and to the opposite buildings, and also on condition that other intended new buildings in Rodney-street be kept to the same height. Mr. Selway, in moving that the recommendation of the committee, sanctioning the new buildings, be confirmed, said that originally the height was about 60 ft. in a roadway of only 44 ft. or 45 ft. in width, and the committee not being able to recommend that, the amended plans had been sent in, and the committee were favourable to their being granted, particularly as there was a neighbouring block of buildings where the applicants had the power to carry them up to their full height, in which the parties were agreeable to keep to the height of 51 ft. 9 in.

STATE OF COVERHAM ABBEY.

"A TOURIST" in Yorkshire writes,—I have been to Coverdale, and seen the ruins of Coverham Abbey. Had I not seen with my own eyes the disgraceful state—I use the word advisedly—in which this ruin is permitted to remain, I certainly could not have credited it, or believed that any owner of such property would have been so indifferent to its architectural value, even if he had no regard to its historical associations. When I tell your readers that a portion of the building is converted into a cow-shed; that part of the south aisle of the church is made a receptacle for dung; and that a small archway leading from the church into the cloisters is transformed into a 'petty,' I think I shall have said enough to excite their astonishment that such a thing could be said in this nineteenth century; and their disgust that the possessor of these interesting ruins has no more regard for decency. I do not know who owns the property, and I purposely avoided making the inquiry. Whoever he may be I trust the Architectural Society will bring their influence to bear upon him, so that such a standing disgrace may be at once and for ever removed.

I may add that this abbey is a rich store-house of interesting archæological detail, and well worthy a visit, despite the obnoxious features above-named, and it can be readily reached from Middleham by a drive of about three miles over Middleham Moor, whence some pretty views of Coverdale may be obtained.

* See p. 500, *ante*.

THE ALBERT MEMORIAL CHAPEL, WINDSOR CASTLE.

THE ALBERT MEMORIAL CHAPEL, WINDSOR CASTLE.

SOCIETY FOR IMPROVING THE CONDITION OF THE LABOURING CLASSES.

THE Report read by Mr. Payne, the secretary, at the general meeting of this Society recently held, included these paragraphs:—

"The Artisans' Dwellings Bill of the present Session must be regarded as a step in the right direction. At the same time, Lord Shaftesbury (whose title to be heard, as the originator of the model houses, and the prime mover in the renovation of Tyndall's-buildings, and like haunts of the worst forms of vice and disease, is recognised on all sides) has pronounced the measure to be defective in not providing sufficiently for the re-construction of tenements from which the inhabitants are ejected. Nevertheless, it will be generally felt that the Artisans' Dwellings Improvement Bill of 1875 is a manifest advance from previous legislation. Professing to proceed 'entirely on sanitary grounds,' it is a measure for removing unhealthy houses with the smallest possible inconvenience to the occupiers. With regard to the rest, there is reason to believe that further enactments in the way of change or addition would be forthcoming on the necessity for such being fairly established. . . . . Your Committee are in a position to assert that this Society has served to initiate incentives to others, and has aided in calling out no small amount of corresponding effort, both at home and abroad. . . . . To maintain the metropolis stationary as regards wholesome dwellings would be, in itself, a very serious labour; it is only very great efforts that can mitigate the horrors of overcrowding, uncleanliness, and disease, amongst the poor.

The mortality throughout the houses is again in excess of the average, or slightly above 23 per thousand. The death-rate throughout the country is estimated at 22½; that in London at 24. But that comparatively favourable return embraces wealthy districts as well as poorer, a fact scarcely at all times, receiving the consideration it should. One thing, at least, in the opinion of your Committee, is certain, that dwellings occupied in defiance of sanitary laws, act with immense force upon bodily health, and the reflection is suggested that, allowing for the drawback of an unfavourable year, unless counteracting agencies were in operation, the mortality in numerous districts would be much more serious. Your Committee are gratified to state that the Medal of Merit awarded to this Society at the Vienna Universal Exhibition of 1873, has been received since the last annual meeting. This is the fifth occasion on which the Society has obtained such a distinction.

The amount received by the Society from all sources during the year was 5,689*l.* 18s. 4d., which, with a balance in hand at the beginning of the year of 490*l.* 12s. 11d., made a total of 6,180*l.* 11s. 3d. The current expenses of all the Society's houses (including repairs) amounted to 3,701*l.* 14s. 1½d.; interest on loans, &c., 867*l.* 13s. 9d.; special contracts and other claims, 401*l.* 18s. 11d.; printing, books, stationery, and advertising, 64*l.* 14s. 11d.; salaries and agency, 578*l.* 8s. 7d.; rent of offices, coals, cleaning, and all incidentals, 139*l.* 15s. 6d.; leaving a cash balance at bankers, and cash in hand, of 426*l.* 5s. 5½d. The property belonging to the Society is estimated as worth 34,974*l.* 9s. 6½d., and the general liabilities amount to 21,998*l.* 0s. 9d.; leaving assets to the amount of 12,976*l.* 8s. 9½d."

Mr. Kay-Shuttleworth, M.P., in seconding a resolution to adopt the report moved by the Hon. W. Cowper-Temple, bore testimony from personal observation to the excellence of the Society's work. Among the visits which he had paid to various parts of London, none, he said, had interested him more than those which he had paid in the company of the Society's secretary, Mr. Charles Payne, to some of the courts which had been renovated by that Society. The Society had not aimed too high in such cases. It had cleansed and improved without spending too much money. And now that Parliament was dealing with that question, it should not be forgotten how much that Society—and in saying that he referred especially to its noble president, Lord Shaftesbury—had done to promote the object. There was now greater need than ever of societies which would rebuild. The Artisans' Dwellings Bill did not require the Government itself to build houses, but it offered great facilities for that purpose, and it invoked the assistance of societies and private individuals in providing the necessary funds. He was glad to observe that the report spoke so favourably of the Government Bill; and they had the assurance of the Government that if that measure did not answer the purpose, other legislation would follow. He had been glad to learn from the Home Secretary, Mr. Cross, that he had received from the Corporation of the City of London and the Metropolitan Board of Works assurances of their intention to do their best to carry out the object of the Bill as soon as it had been passed.

Dr. Ross, Medical Officer of Health for the St. Giles's district, in supporting the resolution, said the Society's house in Streatham-street was built on the best principles, and the amount of sickness and mortality was exceedingly small. He did not believe the deaths were more than 10 or 12 per 1,000 per annum. He then alluded to the operations of the Society in Wild-court. The mortality of the locality generally was, he said, very great; but as regarded Wild-court, the returns respecting febrile diseases were extremely satisfactory. The Great Wild-street district was, in fact, a fever-haunted district; twenty-seven fever cases were sent thence to the fever hospital at Stockwell this year, and only one of them came from Wild-court. That was a specimen of the results of the work of that Society. From another court—Lincoln-court—a court of similar character to Wild-court, before the Society obtained a block of buildings there, eleven cases were sent to Stockwell during the same period.

Mr. George Godwin moved a resolution thanking Lord Shaftesbury for his unabated interest in the operations of the Society. Referring to a visit which he had lately paid to Tyndall's-buildings, he testified to the great improvement which the Society had made there in comparison with the state of things which he found to exist when he visited the same spot sixteen years ago, and he gave an account of its condition at that time from notes he had then written on the spot. The same class of people, he observed, were there now as before, but they were elevated. As regarded Lord Shaftesbury, Mr. Godwin observed that his lordship's life had been a most extraordinary one, devoted as it had been to the helping of those who could not help themselves. His lordship could, he added, have had no other object in view from the outset of his useful career than to benefit his fellow creatures. In commencing life he had all that other men struggled to obtain, and yet he had devoted himself energetically and continuously to advance the welfare of the whole community.

Canon Nesbit, in seconding the resolution, formally presented to Lord Shaftesbury the medal awarded to the Society at the Vienna Exhibition of 1873, adding that it was the fifth medal of that kind which his lordship had gained. Where wretched dwellings existed vice and immorality reigned; but there was strong and independent testimony to the moral elevation which had arisen from the operations of that Society. He concluded by eulogising the chairman as the friend of the factory children, the chimney-sweepers, the ragged-school children, and numerous other objects of his philanthropic care and labours.

Lord Shaftesbury, in the course of a very interesting address, said it is exactly thirty-one years ago since a meeting was held to found this Institution, and now, after the lapse of thirty-one years, I am able to say that I have taken the chair at every anniversary. When we met here in the year 1842, this Institution was, I believe, the first of the kind that was ever formed. I am not aware, at least, that any institution had been formed previously simply for the purpose of improving the dwellings of the working classes. As you have been reminded in the report, the example set by this Society has been followed not only all over England, but also in America and in many parts of Europe. Within the last three months I have received several communications from Rome, from that grand old man General Garibaldi, imploring me to give him advice in reference to the providing of suitable buildings for working people in Italy, and asking for plans and engravings for his information and guidance; and only the other day I had a letter from him expressing the deepest gratitude for the assistance which we had afforded him. From this letter it appears that he positively gloated over the plans and views of Shaftesbury Park, the publications of the Labourers' Friend Society, and Mr. Roberts's book; and he says that he had derived from what he had received the greatest assistance in carrying on his own efforts. My friend, Mr. George Godwin, has been kind enough to speak of me in far more complimentary terms than I deserve. I must tell my friend this, that the long experience which I have had has led me to the conclusion that in these matters a man can do nothing by himself. I could certainly have done nothing if I had not had such men as Dr. Greenhill, Dr. Ross, Canon Nesbit, and many others of the same kind, to co-operate with me heart and soul, to work along with me, to give me assistance, and to contribute to the formation of that public opinion without which it would have been impossible for us to carry our efforts to a successful issue. Now, you know, we have attained success up to a certain point. The Bill which has been recently introduced by the Government must be praised as a grand and noble effort to meet and overcome one of the most frightful evils that ever prevailed in a civilised land. Whether it will accomplish its end is another question. I am inclined to think that it will want the motive power. I am inclined to think that it will lie dormant for a considerable time; but, nevertheless, we must give the Government credit for it, and the consummation of our desires would be the undertaking of the work of improvement by the responsible authorities. The work is, indeed, not yet anything like completed. You have all heard the description which Mr. Godwin has given of the state of Tyndall's-buildings some sixteen years ago, if I am not mistaken, it was at my request that that gentleman went there at that period. I myself visited Tyndall's-buildings a short time before that, and I believe that he has understated the actual condition of things. Anything more frightful I have never witnessed. I could not have stopped in the place longer than I did. On diving into one of the cells there, I saw a woman and five children breathing an atmosphere which was foul through filth. There was an open cesspool close by, with nothing to carry off what was there, and the mother and children were daily subject to such noxious influences. I was obliged to go away very quickly. In that very year, from Tyndall's-buildings alone, more than twenty-five cases of fever were sent to the hospital. What is the state of things now? There has not been one case of fever in the whole district for several years. That shows what may be done by the renovation of houses of the worst description. I am satisfied that we must direct our special attention to this question of renovation, that being the only way in which we can improve the domiciliary condition of the working classes. I mean of the poorer sort.

ON THE DECORATION OF CHURCHES.

AT the closing meeting of the Architectural Association, Mr. Pullan, as mentioned in our last, read a paper on the "Decoration of Churches." He said that before entering upon the consideration of the various styles of church decoration, and the modes of applying them, he wished to make a few remarks on certain misapprehensions which prevailed on the subject of polychrome generally, for notwithstanding the fact that of late years the public taste had so veered round in its favour that a large majority of men of all shades of opinion were advocating the decoration of their great metropolitan basilica, there still prevailed certain prejudices against the use of colour in their public buildings, and objections to its employment were often urged, even by architects of repute. These objections he thought it desirable to meet, and these prejudices, if possible, to overcome. Objectors might be divided into three classes:—1. Those who were altogether opposed to polychrome on the ground that they preferred to see the materials of which their buildings were constructed plain and unadorned, and, as they called it, undisguised. 2. Those who did not object to decoration, provided it be executed in the tertiaries or other indefinite tints. 3. Those who admitted of decoration of any kind—anywhere except in a place of worship. The opinions of the second of these classes were the most widely spread. He would therefore consider them first. They looked upon positive colours with distrust; they were inclined to regard them as *per se* gaudy, tawdry, and meretricious, and to consider the employment of them in dress and decoration as an indication of a vulgar taste. This idea was not confined to the uneducated, but, on the contrary, prevailed amongst those whose taste in other matters was most refined. It appeared to proceed from an inability to judge of the proper effect of colour, and a consequent predisposition to take refuge in a neutrality, or it might be the result of a natural timidity which prevented those who could really appreciate the beauty of brilliant colouring from admitting their admiration lest they should be looked upon as advocates of what was *outré*, and not in accordance with the present fashion. But they were, to say the least, strangely inconsistent; for while they preferred to clothe themselves and their surroundings in funeral black, sombre brown, or neutral gray, and while they would shrink with horror if it was proposed to them to use Pompeiian red on the walls of their dwellings, they tolerated, or even professed to admire, the glowing hues of the windows of Chartres or York, the azure and vermilion of Fra Angelico's paintings, or the pages of illuminated MSS. They looked with complacency on the red coat of the soldier, "the pink" of the huntsman; the bright blazonry of their coats of arms, and regard with pride the red and blue of "the flag which braved a thousand years, the battle and the breeze." He (Mr. Pullan) would ask them if they thought the scarlet of the poppy amid the yellow corn, the

blue of the forget-me-not on Alpine pastures, or the golden buttercups in the green meadows, vulgar? And what was their opinion about the church decorations and vestments,—the veil of the Tabernacle and the robes of the priests, which, by divine command, were to be "of blue, of scarlet, and of purple." No, bright colours *of themselves* could ever be vulgar, but only become so when improperly assorted or wrongly juxtaposed,—in short, when put together in bad taste. To give an extreme illustration. A man dressed in a scarlet coat, light blue trousers, and an emerald green neck-tie might justly be pronounced vulgar, whereas the man in a scarlet hunting-coat, a bottle-green tie, white buckskins, and top boots would be said to be dressed in perfect taste. To give another illustration more to the point. If any one who had any perception of colour were to enter a church, the roof of which was light blue, with yellow stars, the groining ribs light green, the wall diapers blue on a red ground, without any admixture of black, white, or gold, the dado light green, yellow, or white, his susceptibilties of the beauty of colour would be so deeply wounded that his chief desire would be to get out of the building as soon as possible, not because the bright colours he believed were intrinsically gaudy, but because their vile and tasteless combination produced a discord which jarred against his sense of all that was harmonious and beautiful. If they turned over the pages of Owen Jones or Racinet, which contained the more faithful representation of the decorations of every school and every nation, they would find these bright positive colours predominated in the works of the Egyptians, Greeks, Romans, Byzantine, and those of the Middle Ages; or if they visited the best decorated buildings that remained, they would find bright positive colours employed throughout, and when necessary, the effects of secondaries and tertiaries produced the then combination. A second opinion, that of the first class, Mr. Pullan approached with some diffidence, because it was entertained by some amongst them who were gifted with the highest faculties for the appreciation of the beauty of form in architecture. Their naturally severe taste inclined them to regard with distrust a system of polychromy which they thought deteriorated buildings, instead of improving them by hiding sound materials, and by destroying their form and proportion. This distrust seemed reasonable; yet he would appeal against it to the only two authorities which were available,—nature and art,—to show that from the first colour had been the natural complement of form, and that until comparatively recent times, no building was considered complete unless it was polychromatised. On the day of creation every form, animal, vegetable, or mineral, was adorned with its appropriate colour. The primitive man soon perceived this inseparable connexion of form and colour, and attempted to beautify the sides of his cave or the rafters of his hut by daubing them with ochreous pigments. This decoration became allied to architecture, never to be separated from it until these later days. That the Assyrians and Egyptians used polychrome there was sufficient evidence in the sculptures of the one and the temples of the other. It might be urged that these were semi-barbarous people, who thus manifested the savage tastes for gaudy colours; but the same could not be said of the refined Greeks, who, in the best period of art, used positive colours for the decoration of their temples, both internally and externally. That they did so he had had ocular proof, as, when excavating the ruins of the Temple of Minerva, at Priene, he found vermilion and blue, and patterns indicated by brown lines, on the architraves and other members, which had been buried at least 1,500 years. The houses of Pompeii, the Baths of Titus, and the painted tombs of the Via Latina showed that the Romans painted at least their interiors. Colouring of the most gorgeous description reigned supreme in the Basilican and Byzantine churches; and if they went into any Mediæval church of importance in any part of Europe that had escaped the destroying hand of the restorer, and scraped off the whitewash of the beautifier, they would find some traces of painting in either fresco or tempera. Finally, in England, notwithstanding the repression of oil in the time of the Commonwealth, all architects of eminence, up to the beginning of the last century, agreed in considering painted decoration essential to the completion of a building, otherwise they would not have had, amongst other things, what were called Sir Christopher Wren's suggestions for the completion of St. Paul's. Thus architecture and painting were from the first intimately connected, and it was reserved for others to separate them,—to pronounce polychrome meretricious, and to rejoice in whitewash. The third misapprehension which existed was fortunately not as general as the other two; that decoration was unsuitable to a place of worship. To those who held this view he would say,—Go to the catacombs, the earliest places of Christian worship in existence. Here, at least, was common ground on which all Christians could meet. What did they see around them? Upon the walls and ceilings in some of the chapels in which the faithful assembled were found simple representations of the types and figures of Scripture and symbols of the faith. They would see nothing that would offend the most tender susceptibilities,—no scenes of martyrdom, no bloodshed, no horrors, no three-headed devil, like the Dantesque demon,—

"Gorging and growling o'er carrion and limb,"—

but the Good Shepherd feeding his flock by the side of streams, under the shade of trees. They would see the Ark of Noah, an emblem of the spot in which they stood, where the primitive believer was for a time safe from the storm of persecution without. They would see plenty of flowers, fruits, garlands, and other pleasant pictures,—rude in execution, it was true, but touching as evidences of the faith of those who were living in constant expectation of martyrdom; and they would come away, convinced that if such decorations were executed under such solemn circumstances, it would be hypercritical to object to the principle of church decoration in the present day. Having endeavoured to meet some of the objections that were urged against polychromatic decoration, he came to the more immediate subject proposed for consideration, the styles of decoration. He might here remark that detached studies and sketches would never convey a correct idea of the general effect of a decorated building, and that many of the prejudices that were still entertained against polychrome would disappear if they had better opportunities of seeing decorated churches in their entirety. He was convinced that many of those who had derived unfavourable opinions of it merely from books or from the imperfect attempts that were to be seen in England, were to visit St. Mark's, at Venice, some fine summer evening when the sun's rays, entering at the west door, reflected from the pavement, lighted up every corner of the building, and brought out the rich tones of the marble column, the elaborate patterns of the soffits, illuming the apostles and prophets in the great dome, and shedding a glory around the Majesty in the apse, revealing the gorgeous colouring in its *tout ensemble*, they would be converted from opponents to warm supporters of polychromatic decoration. Believing, then, that drawings representing general effects, however imperfectly executed, would convey clearer ideas of the different styles of decoration than any number of sketches of details, he had prepared a series of drawings embodying the chief features of each succeeding period (which were on view and excited much attention). They were not actually copied from existing buildings, but were based upon observations made at various times during the last thirty years. His attention was first called to the subject at the time of the competition for the decoration of the Houses of Parliament in 1844, at which time he put in a design which he had brought that evening, as it tended as much as any other to illustrate the principle of the employment of positive colours, which was the chief point which he wished to advocate, and which he had endeavoured to show was the prevailing principle of all the best ancient work. Since that period he had seized every available opportunity of visiting both ancient and modern examples of polychromes. He had come back convinced that the most effective decoration was that executed in bright colours,—as at St. Sophia, Monreale, Assisi, the Arena Chapel, and the Library at Sienna. In preparing these rough drawings, to illustrate the various styles of painting, he had heightened the colours to what he conceived to have been their original brilliancy. As the paper was intended to bear a practical character, for the purpose of showing how colours should be applied in the present day, a mere description of ancient examples would be rather out of place. A brief consideration of the different features of each style, with some practical eductions and remarks on modern decorated churches, would, therefore, he felt, be more appropriate. In the basilican churches the pavement formed an important feature. It was generally of *opus Alexandrinum*, a mosaic of geometrical figures composed of serpentine porphyry and palombara, arranged in interlacing circles, encompassing slabs of rich marble and rich pavement, which were to be seen in various churches in Rome. Round the walls of the aisle ran a dado of marble slabs, and above it were pictures or ornaments, erected in mosaic or fresco. Above the architrave there was placed occasionally a frieze of processional figures. Other pictures or ornaments occupied the spaces between the clear-story windows, surmounted by a rich cornice. The roof was either flat, as in Rome, or open-timbered, as in Sicilian churches; in either case elaborately adorned with diapers. The triumphal arch was covered with apocalyptic subjects. Those who had visited Rome would have been able to realise how magnificent in effect, and how gorgeous in colour, the ancient basilica must have been. In the Byzantine churches the introduction of the dome gave increased splendour to the mosaics by affording reflections and cross-light, which heightened the effect of the gold grounds. Fortunately there were many churches in this style in which the decoration remained almost intact: the two finest of these were St. Sophia's, at Constantinople, and St. Mark's, at Venice. With these they were no doubt familiar, as they had been thoroughly illustrated by photographs and in books. There were also churches of minor importance existing at Ravenna, Salonica, and in the Greek Islands, in which many of the decorative features remained. The unrivalled Sicilian churches, the Cathedral of Monreale, and the Capella Reale at Palermo might be classed in this category, as the ornament in both had a decidedly Byzantine character. The general treatment was the same as in the basilica. The wall linings were, however, generally brighter, often carved to the springing of the arches and domes, as in St. Mark's, and fresco was discarded for mosaic,—at least until the twelfth century. About that period the rapidly-increasing number of churches requiring thorough decoration called for a more expeditious and less costly mode of adornment, and fresco entirely superseded mosaic, except for smaller works, such as pulpits and other articles of church furniture. As there was no existing example of a thoroughly decorated Lombard church, and but little painted ornament of that period, he thought it allowable to use Byzantine forms in the ornament of a church in the Lombard style which he had recently built at Baveno, especially as there was great affinity between the ornamental form of the two styles. In some of the churches in the North of Italy there were a few remains of the painting of this period; and in contemporary churches in France the wall paintings were more complete, and in them there was observable a falling off from the drawing and brilliant colouring of Byzantine times. But colours resumed their brilliancy in the hands of the Gothic masters of Italy. The walls of the Arena Chapel at Padua resembled pages from an illuminated MS. At Assisi St. Maria Novella, in Florence, there were frescoes which, though faded now, must have been originally of intense brightness. A similar system to that was adopted in earlier times. There was a dado with diapers or figures of dark tones, pictures in bright colours on walls, and a vault of blue, powdered with gold stars. Afterwards ornamental gave place to figure painting, and the artist renounced subordination to the architect, and therefore decoration being mere figure painting, did not come under the scope of this paper. Having thus briefly glanced at the peculiarities of the various sorts of decorated churches, let them see what practical deductions might be derived from the study of them. Good decoration consisted in the application of harmonious colour to appropriate forms; therefore the subject had to be considered under the head of form, with regard to style, ornament, and costume; and under that of colour, with reference to tone, harmony, and style of colouring which prevailed at certain periods. Up to the tenth century colouring did not vary much in either the Basilican or Byzantine churches. The almost invariable gold ground made it requisite that the draperies should be light in colour, or relieved by strong light, otherwise the brilliancy of the gold would attract the eye first, and render the figures dark spots. They frequently saw this effect in Renaissance work, where dark colours,

unrelieved by white, were used with dark shading. In all the best mosaics there was abundance of white in the draperies. The outlines were bold, and there was an absence of chiaroscuro. In Romanesque churches, ochres and browns, with blue and green, were chiefly used in the lower part of the building; purple and light blue in the upper; the figures were on light grounds. In the thirteenth century colouring increased in brilliancy; and the general tone of the pictures might be described as being umber and blue. In the fourteenth and fifteenth centuries colours became more broken, and greys, greens, purples, and blacks were constantly used; strong shadows were introduced, and the work began to lose the simple architectonic character it had in earlier times. In the sixteenth century the painter altogether abandoned his alliance with the architect, instead of making his work subordinate to the architecture; and wall-paintings, instead of being formally drawn and brilliantly coloured groups of figures, having, when seen from a distance, the effect of a rich diaper diffusing a general bloom over the whole interior, became detached compositions, often with dark backgrounds and forcible shadows projected from one point of light, so that churches became, so to speak, galleries for the exhibition of a number of separate pictures. Such a result would be almost inevitable in the decoration of a large modern building unless the guiding mind of the architect dictated the leading tones and general style of composition. Look at the frescoes in the Houses of Parliament, admirable as pictures, each work a small fortune if painted on canvas and hung up in a gallery; but as they were placed in corridors and other similar positions, in which it was impossible to get the right point of view—discordant with one another in tone and general character,—instead of furnishing examples for future imitation, they were simply illustrations of what should be avoided. The word tone had several significations. He employed it to signify the prevailing tint of the ground which gave the key to the whole composition. The Greeks saw the necessity for tone, hence they covered the marble of their temples and statues with a coating of wax to destroy the unpleasant glaze of purely white marble, and to unite and harmonise the various bright colours with which the effect of their edifices was heightened. A white ground should be abhorred and avoided. Imagine the effect of a building with whitened walls on which were painted figures and ornaments in brilliant colours. It would be in the highest degree tawdry and gaudy. The prevailing tone of Byzantine building might be broadly said to be of a greenish golden hue; of Romanesque building, of a yellow ochreish tint; and of Gothic, of a warm umber. For general purposes a tint like that of a vellum or cream colour afforded the best ground, and white should be used only in small quantities. Much might be said about harmony—such as harmony of contrast, of gradation, and succession; but he would confine his observations to one point. In all theories founded upon that of the prism, it was assumed, and with a great show of reason, that combinations of colours in the proportions which produced white light afforded the most perfect harmonies. For instance, three parts of yellow, five of red, and eight of blue, and so on, through the secondaries and tertiaries. If this be perfection it was evidently the end to be striven after; but if it were so, would it not have been seen at least dimly by the great colourists of the Venetian and other schools, or by those Eastern nations who were universally allowed to have produced the finest specimens of colouring? But could any one show amongst the thousands of shawls that came from India, enamels from China, carpets and pottery from Persia, or amongst the pictures of Paul Veronese and Titian, a single example in which this perfection was attained or even aimed at? Or could they, with all their boasted science, produce more beautiful combinations of colours than the semi-barbarous people of the East had produced by the exercise of their strong natural instincts, nurtured by the vivid colouring of natural objects,—of flowers, birds, mountains, and skies,—which they saw above and around them? No; he believed that a woman of the Turkoman tribe,—the most ignorant of the Nomads,—would, by the exercise of her natural taste, weave a carpet possessing a finer combination of colour than could be designed by the cleverest pupil of their great art manufacturing establishment, though thousands of pounds had been spent upon his education by the purchase of a magnificent library, and the most miscellaneous collection of works of art the world ever saw. That there were laws of proportion which governed colour as well as form there could be no doubt, but he questioned very much whether the law of proportion for the production of white light was that which ought to be implicitly followed. To apply it in the decoration of a church would be next to an impossibility. Let them suppose that the architect, after painful labour, had succeeded in devising a pattern for his walls, in which the exact proportion of the primaries was observed. He would find that when the figure-painter, who could not be supposed to make his pictures conformable to the same law, set to work, the result of his labours would be destroyed, and that the stained glass and coloured materials with which his building was constructed would all tend to neutralise his skilful composition. Correctness of form was as essential as beauty of colour to perfect decoration. The character of the ornament and costumes of figures must be regarded with reference to style. There were many amongst them who had reasonable longings for a more perfect style than that which they practised. Up to the present day, however, church architecture had been content to remain an imitative art. The best they could do was to reproduce, and that seldom accurately. It would be too much, then, to expect absolute correctness in decoration; still, it would be unpardonable, with the opportunities they possessed, to introduce Byzantine forms into a fifteenth-century church, or to decorate a Romanesque church with trefoils, quatrefoils, and other geometrical patterns, which were used at a later period. The utmost latitude that should be allowed was the use of the style of decoration employed in Italian buildings of the thirteenth and fourteenth centuries, and in churches of the same period in their own country, and that for the sole reason that the Italians of those days were masters of decoration, while contemporary wall paintings in English churches were but roughly drawn, and coarsely coloured. They should confine the foliated ornaments of their Norman buildings to conventional imitation of ferns and other plants used as models in Norman times. In thirteenth-century churches let them employ the lily and the rose; in fourteenth and fifteenth century buildings the vine, strawberry, oak-leaf, and other similar leaves that they saw in Third Pointed churches. In geometrical ornaments they should observe the progress in cuspidation that was visible in architecture. The same might be said with reference to costume. The representation of an event described in Holy Writ was at the best symbolical; attempts at realisation often ended in vulgarity. In viewing Fra Angelico's "Descent from the Cross," or Luini's "Crucifixion," it was the expression and power of execution and colouring that they regarded rather than the dresses of the figures. So that the story was well told, it was better that educated taste should be gratified by the accordance of the costume with the architecture than that it should be offended by futile attempts at realism. The subject of "Christ disputing with the Doctors" was better represented by Luini's pictures in the National Gallery, although the figures were in the fifteenth-century costume, than it would be by a representation of a Jew boy, surrounded by old Jews, studied in the streets of Smyrna and Jerusalem. One fault of modern decoration was that one uniform treatment of figures and draperies, though it was that of the best period—viz., of the time of Fra Angelico—was adopted for every church, whatever might be the style in which it was built.

Although there was no certain law to be followed in the combination of colours for decoration beyond the ordinary rules relating to contrast and harmony, a few maxims based upon the combined observation of those who had studied the subject might be useful for those who had to do with decoration of churches and other buildings.

1. The lines of the decoration should ever be made subservient to the lines of the architecture, and colour should be employed for the purpose of accentuating the construction. Thus, bands should encircle arches to give the appearance of strength, and should be carried horizontally or vertically, according to the principle of the style. Salient mouldings should be made to project, and hollows to recede by the use of warm or cool, dark or light colours. Breadth might be obtained by use of a monotone, by patterns in two shades of the same colour, or by an elaborate subdivision of the various colours.

2. The lower part of the building should be made more uniform in colour and darker in tone than the upper. Colours and patterns should increase in brilliancy and elaboration as they ascended. In the Basilican and Byzantine churches the dado was of a uniform colour, and was crowned by brilliant mosaics. In Gothic churches dados of sombre tints were surmounted by higher pictures and diapers, the whole crowned by a light blue vault, with gold stars; and in the Renaissance, ceilings as gorgeous as that of San Marcello, surmounted walls of a deeper tone. Those who had visited Damascus could call to mind the magnificent *lewans*, in which the walls of marble inlays, sobered in tone, were finished by ceilings of cedar, painted with vermilion.

3. Neither positive colours nor those dark in tone should be used in masses. Heaviness would be the result; and they learnt this from nature, in which bright colours were only seen in minute quantities.

4. The law of heraldry,—colour on metal, or metal on colour,—should be observed as far as practicable. Colours should be divided from one another by lines or masses of white, gold, or black, or, if it be necessary, to place one colour upon another, and if the ground be dark and the pattern light, the margin should approach white as nearly as possible,—black, if the ground be light and the pattern dark.

5. When colours were juxtaposed they should not be of equal force.

6. The greater the volume of light in a building, the lighter and brighter should be the colouring. Where there was neither stained nor toned glass, a partial decoration, confined to the heightening of mouldings, as in the roof of San Miniato, at Florence, was to be preferred.

7. The materials of which the church was built should give the key-note to the colouring. Pavements, walls, and columns of dark marble or stone necessitated corresponding depth in the colouring, and *vice versâ*. For instance, porphyry columns, together with light-red diapers on yellow walls, would produce a hot, unpleasant, garish effect; a yellowish-green or grey ground, with dark-red patterns, would be preferable.

8. Stained or toned glass was a desideratum in the polychromatised building, except when the direct rays of the sun threw rainbow-hues upon the walls, which was seldom the case if the glass be sufficiently thick. The light admitted through the stained glass enhanced the general effect by giving the whole a mellow tone. In the church of St. Germain des Pres, Paris, the paintings in the transept had a very crude appearance, owing to the light being admitted through plain white glass, while the nave was bathed in a warm yellow glow, which tended to soften violent contrasts, and to tone the colouring which otherwise must be found to be too forcible.

9. Every church should be designed with an eye to its future decoration. It should be remembered that a well-decorated interior was preferable to a showy exterior, and that wall-painting afforded a more effectual and more economical mode of adornment than external carving in stone. Durability was not the sole object to be kept in view. Art at present was in but a transition state; they were working on no fixed principles, and many of the buildings upon which they prided themselves might be regarded with a feeling akin to contempt by their successors, who would probably wish that they had perpetuated their ideas in plaster, instead of perpetuating them in massive granite or ponderous bronze. For such reasons he considered tempera or oil preferable to mosaic, for they had not reached that perfection in the art of decoration that would justify them in carrying out their designs in ineffaceable materials.

Finally, let them inquire how far true principle has been carried out in the decoration of modern buildings. The Basilica of St. Boniface, at Munich, was a fair revival of the ancient basilica as regarded its general features; but as regarded the decoration, although the drawing of the figures was excellent, there was a want of severity about the forms, and ornament, and tones of the colours which interfered greatly with the general effect. At St. Vincent de Paul, Paris, polychrome had been applied in a much more satisfactory manner. Above the architrave there was a deep frieze, with processional figures on a gold ground, and above the columns of the upper story a rich band of large and small medallions, with intervening figures in bright colours, evidently imitated from that at Monreale. He knew of no Pointed decorated church in Ger-

many, and must therefore confine the comparison to the modern French works, La Sainte Chapelle and Notre Dame de Paris. The former had a restoration of the ancient colouring by Lassus and Vitet; the latter was decorated by Viollet-le-Duc. There was no great difference in the dates of their buildings, but a striking contrast in the manner in which they were decorated. In one the colours were brilliant, the contrasts fine, and the patterns correct; in the other the colours were weak, laid often in great masses, relieved only by small patterns placed at equal distances apart, and the foliage was rather of the modern French school than like that of the Gothic of any period with which he was acquainted. The same might to a certain extent be said of the polychromatic decoration of St. Denis, though that was an improvement on Notre Dame. In their own country, decoration owed much to amateurs. The ceilings of Ely, commenced by Mr. Styleman L'Estrange, and finished by Mr. Gambier Parry, was a splendid monument of what could be accomplished by gentlemen of refined taste who devoted themselves to such a labour of love; the works of the latter at Gloucester Cathedral and Higham Church were well worth inspection, and the spirit which produced them well worth imitation. In conclusion, Mr. Pullam called the attention of the members to an attempt he had lately made to carry out correct principles in the church at Baveno. The plan was octagonal, partly because it was most suitable for the site, and partly because several Lombard and other Romanesque churches were built on the plan; amongst others that of San Tommaso, at Bergamo. The walls were of granite, of a warm tone, from quarries in the neighbourhood, with narrow courses of grey marble intervening. Internally, there was a dado of polished grey marble from Carrara. Considering that the general tone of the walls should be warm, he had them grounded with yellow ochre, cooled with a little raw umber, and covered with elaborate running patterns in reddish-brown. These two colours produced, when properly employed, one of the finest harmonies. In order to soften the contrast between the grey dado and warm wall, and at the same time to carry out the constructive principle, bands of grey ranging with the courses of marble of the exterior were carried through, separating the red lines of foliated patterns. These bands were relieved by white pateras, with spots of bright red in the centre. The soffits of the main arches were treated with geometrical patterns like those of Sta. Sophia and Monreale, and at the crown of each arch was painted a half-length figure of an apostle on a blue ground. Borders of floriated ornament strengthened the lines of the arches. The spandrels were filled with interlacing patterns on blue and chocolate grounds. The roofs throughout were covered with bold arabesques, the stems being chocolate, the flowers and leaves of bright positive colours. These stems of foliage were bordered with white and dark lines, and were heightened with white. The ground was the natural colour of the wood,—red Baltic darkened with oil, then varnished. This resembled in tone the gold ground of the Byzantine mosaics. The cornices were red, and blue in panel. There were twenty-four windows filled with stained glass in the clearstory; these, as well as the lower windows, had colonnettes of black marble, which tended to lower the colouring. The pavement was Veneziano, and the pulpit of Porto-Venere, with mosaic inlays. The organ and other furniture were painted, so that there was no part of the building uncoloured. In this church, and at the Church of St. John, Hawarden, which was decorated many years ago, not precisely as he directed,—for the incumbent, who was his own decorator, carried out his own views,—to a certain extent the general principles and maxims just mentioned had been followed.

The President said that Mr. Pullan had raised many interesting points in his paper, which was of especial value at the present day, especially as the subject of the decoration of churches was now an important question. Mr. Pullan had alluded to the church of Sta. Sophia, at Constantinople, which was a work of so much excellence that they might almost be excused for coveting the possession of it. In the course of their forthcoming excursion to France it was hoped that the members would meet with churches of the Byzantine type.

Mr. Penrose said that the subject of church decoration was one which of late years he had studied a good deal, and he envied the lecturer's extensive knowledge of the subject. From his earliest day Mr. Pullan had followed it up, and they might regard him as a master in the art of church decoration. Speaking generally, he agreed in Mr. Pullan's views, but there were a few points in which he would perhaps be disposed to take a somewhat different course, as he thought that Mr. Pullan had not quite given all the credit he might have done to the true value of the tertiaries. He (the speaker) thought that in this climate there was something more to be said in favour of the tertiaries than had been brought forward. In the magnificent climate of Italy and Greece, where the openings could be reduced to a very small compass, strong colours might be used to a much greater extent than in England, and in this country they must feel the propriety of adopting a somewhat lower key of colour. Even English birds were not so brilliantly dressed by the hands of the Creator as those in some of the southern parts of Europe. Altogether, he wished to plead for the tertiaries to a great extent, but, at the same time, by giving undue weight to the natural quality of the climate the colours might be toned down too much. He was extremely glad to hear from Mr. Pullan that the strong colours should be kept comparatively small, for that was quite in accordance with nature, the most brilliant points of colour being generally the heads and extremities. He had usually noticed that the most successful effect in colour was produced by bringing the work through a number of gradations to a high point, and then going off to a contrast; and this was a very important point to consider. With regard to colouring of Greek temples, a subject to which he had directed special attention, he believed that the columns and walls of the Parthenon had been toned down to something like a cream colour, as the brightness of the marble would otherwise have been insufferable. They had indications of the toning down of the colour in this building from various writers, but he thought only to a moderate extent. The effect of a landscape would be quite spoilt by a snow peak or glacier being brought close to the eye, as the snow was quite insufferable; but a white rock would be quite right, and not destroy the harmony, so that the difference between the rock and the snow peak or glacier was all that would be found essential to the toning of the colours. With respect to the employment of stained glass, this was a difficult point to settle at the present day in a building the walls of which were thoroughly painted. He was pleased to hear the lecturer pay tribute to the merits of Mr. Gambier Parry and Mr. L'Estrange for their works at Ely and elsewhere. In regard to the church at Baveno, Mr. Penrose said, in conclusion, that he had seen it when it was partly built, and was sure that it fulfilled its early promise. Of the decoration he knew little; but he heard that it was extremely beautiful, and gave immense pleasure to all who saw it.

Mr. H. Stannus did not think it within the province of the student to take up the gauntlet thrown down by such an eminent authority as Mr. Penrose, a man of world-wide renown. They were present merely as students to learn from the ripened judgment of one who had seen many, if not all, of the finest specimens of coloured decoration in the world. Reference had been made to the early Christian pictures in the Catacombs; they were all of a character to show that the religion of the early Christian was a hopeful thing, there being an absence of diabolical representations. He was disposed to think that in the treatment of colour the satisfactory method was to have the gold ground put on first, and then to paint up to it. He deprecated the manner in which Mr. Pullan had made allusion to the South Kensington Library, which he considered, in connexion with art, was the finest in the world.

Mr. Scott did not think that colour could be used in mouldings, its use in such case being very injurious. Their effect ought to depend on light and shade.

Mr. Ferrey inquired whether it was not as well in some cases to leave the ground of the ashlar in a ceiling perfectly exposed.

Mr. Pullan, in reply, said that in some cases it would spoil the ceiling to coat it with colour. In many cases, where they had a nice mellow warm tone in the ashlar, it was sufficient to put the diapers on the ashlar instead of covering it with a coating of colour. Mouldings in a certain position required to be relieved by colour, and a skilful decorator might produce an effect of depth in mouldings by means of colour, an effect which the architect had omitted to produce.

Mr. Payne took exception to the habitual depreciation of the colours of Nature in England. He had travelled in many countries, but on a fine day he believed that in many districts,—for instance, Dorking and other parts of Surrey,—the colours of Nature were as bright as in Italy.

Mr. Pullan, in reply, said that with regard to practical decoration by means of decorative materials, that would be very desirable if the materials were available, but until marble could be obtained at a reasonable rate they must fall back upon painting. Many looked with horror upon veneering in marble, but he might tell them that he had found veneers of marbles of the richest character while digging at the Baths of Caracalla. Considering that this was one of the finest buildings in the world in point of art decoration, and as veneers of the richest marbles were evidently employed, the fact ought to be borne in mind by any one who might be disposed to sneer at veneer decoration.

WATER-WASTE PREVENTERS.

Now that the extension of the constant supply system by the water companies necessitates the use of apparatus for the prevention of waste of water, additional attention has been directed to the various appliances in the market for accomplishing this object. The majority of those in use consist of small-supply cisterns of sufficient capacity to contain a charge suitable for flushing the water-closet (*i.e.*, one and a half to two gallons), fixed on the walls of the closet or urinal in any convenient position, and fitted inlet and outlet valves so arranged that when one is open the other is shut, thus preventing the discharge of a greater quantity than the contents of the supply cistern at one time. These are, however, open to the objection that, besides occupying considerable space, and forming unsightly excrescences on the walls against which they are fastened, they are liable to overflow and flood the room, from the inlet valve leaking. There is one manufactured by Messrs. Pontifex & Wood, of Shoe-lane, consisting of a cylinder furnished with a small four-way cock, which directs the water supply alternately against either side of a movable piston, thus expelling the full charge on the other side of the piston into the closet, which is free from the above objection. This apparatus is fixed under the seat of the closet, and worked by raising the handle that empties the pan; and while thus placed in the most convenient position, it has also the advantages of extreme simplicity and nonliability to derangement, and at the same time its construction renders it impossible for it to overflow and so cause annoyance and damage. This water-waste preventer has been in the market some little time, and we understand is giving satisfaction.

THE METROPOLITAN WATER SUPPLY.

AT a meeting held recently in Southwark, for the purpose of hearing from Col. Beresford, M.P., an explanation of the principles of the Bill now before the House of Commons, which proposes to rest the management of the metropolitan water supply in a Government Commission, the hon. member made some statements as to the extent and character of the supply. After observing that he had been induced to take action in the matter by what he had seen and heard of the distress and sufferings caused in Bermondsey, in 1872, by what was virtually a water famine, he stated that the evidence which had already been laid before the Committees of Parliament was to the effect that purity of water and security of supply could only be obtained by a constant instead of an intermittent supply. He then remarked that the object of his Bill was to take the supply of water to the metropolis out of the hands of private companies, and place it under the management of a commission, composed of able men, to be appointed by the Government, to secure a constant supply of pure water to every house, and to have hydrants, to which hose should be attached, and of which the police should have the keys, at distances varying from 50 to 100 yards apart. In Manchester, Liverpool, Berlin, Paris, Hamburg, and other places, the water-supply was now in the hands of the public authorities, and in every case was better managed and less expensive than when it was in the hands of private companies. He next made the statement that the official report of the inspectors showed that 110,000,000 of gallons were supplied daily by six of the water companies, and this supply was independent of the Kent and

New River Companies, who had made no returns. The number of houses supplied was 516,562, of which only 61,964 were on constant supply. The total number of persons supplied was 3,699,363. There were 516,562 miles of mains, 3,544 of which were in the Metropolitan District, and only 666 constantly charged with water. There were 2,542 hydrants, and the number of fire-plugs in 1873 (there was no return for 1874) was 43,666. He added that he expected to be opposed by the water companies, although not by the Government. The opposition of the water companies, however, would, he had reasons to know, be only in the hope of increasing the dividends they would receive if their properties were taken by the public; but this opposition would not be either a justifiable or a wise one, for the Bill provided that they should receive fair compensation.

A NEW ELECTRIC RAILWAY SIGNALLING APPARATUS.

A NEW electric interlocking and blocking signalling apparatus, which has been invented and patented by Mr. W. R. Sykes, an electric engineer in the service of the London, Chatham, and Dover Railway Company, has this week been introduced in working the traffic of the Metropolitan Extension of that Company's line, the apparatus having for some time been in course of construction at the Brixton works of the electric and signal department. It is claimed for the invention that whilst it will be the means of preventing collisions arising out of the present imperfect system of signalling between station and station, it will at the same time relieve, to a considerable extent, both the physical and mental labours of signalmen, and that by the electric connexion of the apparatus between station and station, the moving of levers, and starting or passing trains by mistake on the part of signalmen, will be rendered almost impossible.

A MODERN INDIAN PALACE.

THE new palace, which has been in course of erection for the Maharajah Scindiah of Gwalior, is fast approaching completion, and is expected to be finished in about three months. The public have been excluded from the precincts, so that there may be no hindrance to the progress of the work,—the cause of this haste being a hope that the Prince of Wales will visit Morar, and become the first guest entertained in the new structure. The *Madras Mail*, in describing the building, says that, as seen from a distance, it reminds one of the Tower of London, an edifice which we should scarcely have thought Indian architects would have selected as a model for reproduction in their climate. It is situated at the south-eastern end of Fortress Gwalior, adjacent to Scindiah's native city, the Lushkar. It is placed in the midst of handsome grounds, "abounding in tasteful landscapes of fell, lake, waterfall, and fountain, and is in the Italian style, in the form of a large quadrangle, with a beautifully laid-out garden in the centre." The entrance is on the southern side, and the central portion of this front rises like a tower above the rest of the building. The structure is surmounted by four turrets at the angles, but its apparent substantiality is merely a cloak for flimsiness, and it is far from rivalling in strength the old castle on the Thames. Exteriorly, "Scindiah's Palace" is beautifully done over with white stucco, but so flimsy is the masonry work underneath that a strong wind recently blew down some massive iron railings, that looked most firmly imbedded in the wall of an upper front verandah.

UNINHABITABLE HOUSES.

THE Home Secretary, in his late post of chairman of a quarter sessions in Lancashire, had, now it appears, every opportunity of becoming acquainted with the horrible condition in which the artisans' and labourers' families dwelt, in his own neighbourhood; for, at the annual meeting of the Manchester and Salford Sanitary Association, Dr. Morgan stated that, after trustworthy inquiry, he found there were no fewer than 80,000 people in Manchester and Salford living in uninhabitable places, by which he meant places where it was impossible to enjoy life. Indeed, to use the word "enjoy" in relation to these conditions of living was to be guilty of an absurdity. Such people hung on to life, as it were, by a very delicate thread.

THE COST OF OUR PAUPER CHILDREN.

A RETURN ordered by the House of Lords has just been issued, showing the number of orphans and deserted pauper children boarded out in the different unions of England and Wales, and the average cost per week to the ratepayers of each child; together with the average cost per week of a pauper maintained in a workhouse in the various unions.

From this it appears that the highest average cost per child is incurred by the ratepayers of Dorking, Surrey, who pay 9s. a week each for three boys on board the *Goliath* training ship; and, next to them, by the ratepayers of Kingston, Surrey, who had, on the 1st of July, 1874, to pay 5s. 5½d. per week for each of five children boarded out; while the lowest weekly sum paid by any district is 1s. and a loaf of bread contributed to each of four children by the ratepayers of Droitwich. Northampton stands third highest on the list, with an average weekly cost of 5s. 2d. per child; and St. George's, Middlesex, is fourth, with 5s. 1d.

Taking the total number of children, irrespective of cost, boarded out in the different counties, we find the following counties in the happy state of not having had any charge to bear under this head at the date the return was made out, viz., the 1st of July, 1874:—Berks, Derby, Durham, Leicester, Monmouth, and Sussex. The union with the greatest number of such children is that of Glendale, Northumberland, with 120; Swansea, with 100, comes second; and Newtown and Llanidloes third, with 79.

Besides the children boarded out within the various unions, there were 1,153 in the Central London District School at Hanwell, costing on the average 9s. 1½d. each, and 682 at Anerley, costing 11s. 9d. each per week. The total number of children boarded out, in addition to the above, was 2,764, at an average cost of 2s. 8d. So that our pauper children cost altogether 1,298*l.* 10s. per week, or 67,522*l.* per annum.

In addition to this, the average number of indoor paupers in the metropolis, for the year ended Lady day, 1874, was 39,164, the total cost of whose maintenance was, for that year, 488,798*l.*, or at the rate of 4s. 9½d. per head weekly. And the average number of indoor paupers in all England and Wales (*minus* the metropolis), for the same year, was 104,543; the total cost of their maintenance being 1,160,535*l.*, or 4s. 3½d. per head weekly.

Thus it appears that we spend 1,716,855*l.* a year in support of indoor paupers and pauper children, the relative cost being as follows:—

Average weekly cost of pauper children in Anerley and Hanwell District Schools.....	£0	10	1½
Do. do. boarded out in various unions ...	0	2	8
Average cost of paupers in London Workhouses	0	4	9½
Do. do. Provincial Workhouses	0	4	3½

CLEANSING WATER MAINS.

MR. E. DODDS, engineer to the Durham Water Company, has introduced a new self-acting instrument, termed a pipe-scraper. The water of many companies deposits oxide of iron on the inner surfaces of the main and distributing pipes, the effect of which is to reduce them greatly in size.

The mode of operation is this: the pipe is cut, the scraper is inserted, temporary joints are made, and the water is turned on at the highest pressure, which drives the scraper on at great speed. In the first experiment a distance of 300 yards of pipe was thoroughly cleansed in 2 minutes and 20 seconds.

VALUATION OF PROPERTY IN THE METROPOLIS.

IN the House of Commons, on the 2nd inst., Mr. Hubbard asked the President of the Local Government Board whether he could explain the cause of the general increase in the valuation of property in the metropolis, which had occasioned so much discontent; and whether the increased valuation had been occasioned by instructions from the Local Government Board, with or without concert with the Inland Revenue Office; and, if such instructions had been issued, whether he would lay them on the table of the House.

Mr. Sclater-Booth was not aware that there was a general increase in the valuation of property in the metropolis, but there had been an increase in many parts of the metropolis. The cause of that increase was that the quinquennial period had arrived when, in accordance with the Metropolis Valuation Act, a revaluation of all the property in the metropolis had to be made. This valuation would not come into effect until April 5th next, and in the meantime all parties injuriously affected by an increased assessment would have the opportunity of appealing. No instructions had been given by the Local Government Board, who had no jurisdiction in the matter, nor was he aware that any special instructions had been issued by the Board of Inland Revenue; but the Inland Revenue officer, jointly with the overseers of the parish, had a voice in the preparation of the lists which served as the basis of the assessment. His right hon. friend had sent him lists in which the valuations of property in a certain district and of the rents, as made by a private surveyor and the overseers, showed very great discrepancies in favour of the occupier, and these would, in his opinion, be good grounds for appeal.

THE SURVEYOR OF WORKS.

IN the House of Commons, on the 2nd inst., Mr. Dillwyn called attention to the mode,—partly by salary and partly by commission,—of paying the Surveyor of the Office of Works, and moved that such a mode of paying a public officer was undesirable. Neither should the holder of the office be allowed private practice, as instances might and had occurred wherein the two duties had clashed, and that probably to the disadvantage of the public.

Mr. Lowe, as the person responsible for the arrangement, complained that the hon. member had not given notice of the specific charges he had made, and which of them amounted to positive misconduct. Mr. H. A. Hunt, the present holder of the office, was consulting surveyor, and not an executive officer, and he quoted the report of a Commission appointed in 1869 to inquire into the duties of the office, recommending the mode of payment now adopted. Mr. Hunt was one of the very best officials he had ever come in contact with, and he could not divine what the sources were from which the hon. member had derived his information that he was not acting properly in his situation.

Lord H. Lennox vindicated Mr. Hunt, and said that during the last six years the country had been a clear gainer by the existing arrangement. Mr. Hunt took no business whatever which was antagonistic to the interest of the country, and he would be very glad to give up the commission and be paid by salary only.

Mr. Cowper-Temple bore testimony to the high character of Mr. Hunt, but did not think the existing arrangement as to the payment of his salary was a wise one, and one which could be justified, unless there were exceptional circumstances.

Mr. Hunt has reason to thank Mr. Dillwyn, for the discussion brought him golden opinions from all sorts of men.

REPAIRING A STEEPLE.

THE steeple of the parish church at Westend, Southampton, was struck by lightning on the 12th ult., and a considerable portion of it destroyed. A correspondent of the *Times* says,—"The fall of the remainder being imminent, the church could no longer be used, and it became necessary to pull it down. But how was it to be done? Architects and engineers were nonplussed, and experienced steeple-climbers altogether declined to set foot on the tottering edifice. It was reserved for local talent to design and accomplish the undertaking, which was most successfully carried out on Tuesday afternoon. Spars were lashed to the tower below the steeple which reached a height several feet higher than the steeple (itself 150 ft. high); to the top was fastened a pulley carrying a rope, by which means a noose was run up, and then lowered down till it fell over the top of the steeple; then, with a long and strong pull at the ropes to which the noose was fastened, the topmost portion of the steeple (consisting of a solid block of stone about 6 ft. high) was pulled off. Again the noose was raised and lowered over the truncated cone; but before taking another haul, it was necessary to weaken the ruin by sawing through beams and knocking out bricks on the side towards which it was intended to guide its descent. This most difficult proceeding was carried out most successfully, and at another pull the remainder of the edifice collapsed and fell with grand effect, without causing the slightest injury to any person or to the body of the church. The entire credit of the operation is due to Mr. Haines, builder, of Westend."

THE RYDE TOWN COUNCIL AND PARTY WALLS ABOVE ROOFS.

SIR,—In your last impression, "Admirer of the *Builder*" comments on the recent resolution of the Town Council of this borough on the above subject, and in the previous number you briefly expressed an unfavourable opinion of such resolution: I think it therefore right that your readers should be made aware of the reasons which guided the Council in coming to the conclusion which your correspondent so much condemns.

In Ryde fully 90 per cent. of the dwellings of the working classes are semi-detached, with projecting eaves, and a very large proportion of the houses of a superior class are also semi-detached; indeed, excepting in the business streets, not one per cent. of the houses which have been built since the passing of the "Ryde Improvement Act, 1854," have been erected in rows of three houses or more.

Now, it appears to me, in the first place, that in blocks of semi-detached houses, standing at least 7 ft. apart (there being always a side passage to each house and a division-wall between the passages), there does not exist the same necessity for structural precautions to prevent the spread of fire as in continuous buildings; at the worst, a fire taking place in one house can only extend to one other house, while in the other case whole streets may be burned: besides, the side passages afford ready means for the firemen to pass to the rear of the premises and to attack the fire from all points.

In the second place, all these semi-detached houses have eaves projecting 1 ft. or more; now, there is no power, either in the "Acts of Parliament" or the "Bye-Laws," to compel persons building to corbel out the party wall under the eaves so as to cut off the projecting portions of rafters, slate battens, and fascia; the carrying the party walls 1 ft. above the slates does not, therefore, isolate the combustible materials of each house, as is the intention, and is, consequently, of very little value as a protection against the spread of fire.

In the third place, the so carrying up the party walls materially increases the cost of buildings, *more particularly in the neighbourhood of the sea*. You, sir, as well as your readers who reside near the sea, are aware that the weather penetrates much more through brick and stonework at the seaside than it does in inland places; thus we never think of building dwelling-houses unless all the outer walls are either built with a cavity, or battened, and in order to prevent the wet drawing down chimney shafts, it is a very common plan to bed a piece of lead through the walls and withs of chimneys immediately above the flushing, the lead being turned up inside to catch the water which might penetrate to the inside above such level, and run down the flue; that being so, and in such party walls there being so large an exposed surface in proportion to the bulk of the brickwork, it is necessary to carry lead through the wall, turned down on each side to form step flushings. This, of course, is a considerable addition to the cost, and as the dwellings of the working classes are already much more expensive here than they are in a vast majority of towns, owing, not only to the extra cost of building semi-detached houses, but also to the additional space occupied (a pair having seldom less ground than a plot of 35 ft. frontage, and 100 ft. in depth), and to the fact that the rooms are generally larger, and the houses nearly always six-roomed; it does seem unwise to further increase the cost by a requirement which is of no value whatever from a sanitary point of view, whose value as a protection against the spread of fire is in houses with projecting eaves very problematical, and which even if it answered that end perfectly, cannot be nearly so necessary in semi-detached houses as in houses built in continuous rows.

In the last place, I think it must be admitted that party walls carried above the roof in semi-detached houses with projecting eaves have a very unsightly appearance.

These are the reasons which led me to advise the Ryde Commissioners in 1855, and the Town Council during the present year, not to require the party walls to be carried above the slates in semi-detached houses, and they are also the reasons why the resolutions approving of such relaxations were carried and have been acted upon during the whole of the intervening period, except for about two years, when a party was in power whose policy seemed to be to reverse all the actions of their predecessors.

In reference to the assertion that "there are hundreds of jerry-built houses in Ryde," I would merely say that I have, during upwards of thirty years' practice in my profession, seen a great deal of other towns in nearly all parts of England, and I have never seen a town where the houses, as a whole, are better built, nor any town where the houses of the working classes in particular are so well built.

With respect to the personal references to myself, which are evidently intended to slight and discredit me, I feel that such references made by an anonymous writer are only worthy of contempt, and as such I shall treat them.

Being a zealous advocate for sanitary reform in the days when the *Builder* took a leading part in advancing what was then an unpopular movement, I sought the not very lucrative appointment of surveyor to the town in which I was practising. I retained that appointment for upwards of eighteen years without any inconvenience being felt from my being also engaged in private practice. But at the end of the year 1872 a new party having come into power it was stated to be exceedingly improper to have a surveyor who was allowed to engage in private practice. A resolution was consequently carried to appoint a surveyor who should devote the whole of his time to the office at a salary of 150*l.* per annum; the then Mayor remarking at the time "that he did not suppose Mr. Newman would take the office subject to the conditions, or that there would be no one he would prefer." Another leading member of the Council at that time made remarks to a similar effect. I was then, without notice, and before the party in power had any experience of the mode in which I discharged my duties, ejected from an office I had held for the period above stated, under the plea of requiring a surveyor to devote all his time to the duties of his office, and yet before the expiration of two years my successor was employed by the Mayor above referred to as his surveyor in a private matter.

At the annual election in November, 1874, the members of the Council who had resigned in 1872 (on the faith of a distinct pledge), from those who eventually became their successors, that steps should be taken to obtain a Provisional Order to establish the legality of certain proceedings alleged to be irregular, which proceedings have been reported upon by an inspector from the Local Government Board, and also by the eminent accountants, Messrs. Quilter, Ball, & Co., as having effected a considerable saving to the ratepayers, were returned to the Town Council by overwhelming majorities, the pledge to obtain the Provisional Order having not only been ignored, but obstacles thrown in the way of such an arrangement being effected by these "leading gentlemen," and the burgesses having apparently taken this mode of expressing their feeling with regard to such a gross breach of faith.

I may add that my re-appointment to the office of Surveyor to the Borough of Ryde has I believe given every satisfaction to the large majority of the inhabitants, who have no sympathy with many of the acts of the governing body during the past two years.

FRANCIS NEWMAN.

*** We have nothing whatever to say on the personal part of the question, but we cannot accept as a sufficient reason for not compelling builders to take the party wall through the roof, that the houses in Ryde are usually semi-detached, and that the omission is not so dangerous in this case as when the houses are built in rows! If the laws and bye-laws in force would not enable the Surveyor to compel builders to cut off connexion at the eaves they should be made to do so; and as to the admission of water by means of the wall, Mr. Newman knows very well how to prevent that.

PROGRESS.

SIR,—Although the liberal-minded throughout the world are familiar with the word "progress," perhaps there is not one person in a thousand who, if interrogated, could give other than a vague notion of what he means by it. As well as one can gather from those who do use the word, this would appear to convey to them a gradual and continuous improvement through time, continuous improvement without climax, without finality, without a goal.

If any progress be made under such hazy leading, it must be purely accidental, for he who has no definite end in view must be aimless, and can only by chance, by a fluke, hit the centre "right." It is on this account that, although the word progress is in almost everybody's mouth, there is so little real progress made in the world; for, paradoxical as it may appear, no sound progress can be made till men have those definite and right ends in view, beyond which, when attained, there can be no progress; when, in fact, the only possible change that can be made must be a retrogression, a falling back. Just as in life, there is a topmost height, which, once attained, the remainder must be a gradual descent, a going "down hill": so there are ultimate conclusions to be arrived at by right reason which incontestably demonstrate that rectitude, perfection, and beauty, are finite aims,—are qualities inhering in certain definite conditions, from which any departure must be for the worse, towards error, imperfection, and ugliness, so that when the world shall have attained to rectitude of life, perfection in work, and the beautiful in art, it will be unable to go farther without faring worse; it will either have to remain in the state to which it shall have attained, or to retrograde. To make sure progress, therefore, we must have clear and correct views in respect to those conditions in which these finite qualities inhere.

Although we might show that this haziness of view in respect to progress impedes progress in all departments of inquiry, there is no department which suffers more than art. For every artist and critic abreast of the scientific method in thinking, there are hundreds whose minds are in the nebulous state, and who resist all attempts to treat art questions in any but an impulsive manner. The consequence is that although there is no country in the world in which so much is and has been written about art, there is none in which art makes so slow progress; for criticism is, without method, illogical and contradictory, and being without method, it is too voluminous to be of any practical value.

Vapouring must be the rule till criticism gets back-bone, and imperfect, and haphazard work, till artists have distinct and right ends in view.

There is a prevailing notion that scientific definition derogates from the inspiration of the artist. He would attribute all success in art to the possession of the divine afflatus. Yet seeing how often, very often, this doctrine misleads him into very bad work and very great absurdities, we wonder that he has not long ere this had some misgivings as to its correctness. He ought also to have long since perceived that good work proceeding from intuitive promptings assumes definite conditions of form and colour, and that where these definite conditions recur there will be success. It matters little, therefore, whether the results are sequent upon intuition or conscious principle. Only seeing how seldom the artistic intuition leads aright, the painter and sculptor might try whether conscious principle would not lead them better.

But where shall the artist get his principles? that is the question. Assertion and counter assertion is not reasoning, nor does it lead to scientific enunciation. We shall get very little for our guidance while one-half of the artists and critics are declaring "it is," and the other half that "it is not"; or while artists and critics think that the right in art is an obvious thing requiring little or no effort of the understanding to determine, whereas the principles of art require the most subtle mental analysis for their determination, and are only to be enunciated by patient and deep study. In fact, we have to learn in England what "thorough" means in the study of art as in some other subjects; and till we thoroughly understand what "thorough" means, the country will be content with the position it occupies; but there will be no progress.

W. CAVE THOMAS.

THE DUOMO OF FLORENCE.

SIR,—Have the merits of the Cathedral of Florence been fully recognised by students of architecture? It is my impression that the Cathedral has been slighted while the beauties of its neighbouring campanile have been minutely and eloquently described. In order to perceive more clearly its many excellencies, the student could hardly do better than contrast the Florentine Cathedral with St. Peter's, at Rome. Greatly inferior in size to the world-famous creation of the Popes, the grandeur of the impression it produces is remarkable. The Duomo of Florence is sublime, because it is the perfect expression of a single lofty idea, unincumbered by any irrelevant connexions. However magnificent the dome of St. Peter's may be, its association with the enormous nave and transepts that it crowns is altogether arbitrary. If it dominates them when seen from an extreme distance, it is hopelessly lost in the midst of their mighty extension when it is viewed from any point sufficiently near to distinguish the different features of the church. This is by no means the inevitable result of mere vastness of size, and therefore not to be reckoned a fault at all. The church might have been twice the size that it is, and yet it would not have been necessary to retreat to the distant horizon in order to view it as a whole. The fault of St. Peter's is a fault of conception, and no dome, however magnificent, could give unity to the dissimilarity so evident in the vast building beneath it. On the other hand, the merit of the Florentine Cathedral is nowhere more conspicuous than in the strict subordination of its several parts to the great central feature. Instead of lessening in any way the value of the dome, either by want of connexion or undue prominency, they enable it with perfect effect, while crowning them, to unfold to the utmost the beauty of its lines. In this respect, I believe, that of all the buildings in Europe, the Cathedral of Florence alone does full justice to the dome. The student of architecture who has not stood long and often in that famous piazza of Florence, where, too, are the baptistery and the bell-tower of Giotto, is still in ignorance of the real power of one of the sublimest features of his art. Neither in London, nor Paris, nor Rome, but in Florence only is the dome beheld absolutely triumphant. The stranger who leans on the balconies of the Monte Pincio looks towards what he believes to be "the grandest church ever built by man painted on God's loveliest sky"; but he sees it from a great way off, and the dome of St. Peter's looks no larger than a distant balloon. Only let him hasten to examine it close at hand, and instantly he has to surrender the completeness of his distant image, and thenceforth only knows the church in fragments. He wanders round the vast structure, making futile efforts to catch a glimpse of the dome, ignominiously lost to sight behind the lofty roofs. The cathedral of Florence exemplifies many excellencies. It attains to astonishing grandeur of expression by the simplest means. It has not one extraneous feature. Beauty of detail and costliness of material have little to do with its effect. The variegated marbles might be stripped from its walls, but it would still remain in outline, mass, and proportion the same grand embodiment that it had ever been. Simplicity, dignity, and breadth are everywhere conspicuous. It can boast of elaborate detail in its exquisite doors and windows, but ornament is never suffered for a moment to disturb the supremacy of the above-named great characteristics. St. Peter's, if it astonishes the general beholder, offers little or nothing of value to the thoughtful student; while the Duomo of Florence, if intelligently considered, certainly becomes one of the most suggestive buildings ever reared by man.

S. D.

CHARGE OF FRAUD AGAINST A SEWER CONTRACTOR.

AT the last meeting of the Shoreditch Vestry, a serious allegation of fraud was brought forward. The circumstances, according to the statement made by the Vestry Clerk, are these. The London and North-Western Railway Company was required by Act of Parliament to make a new thoroughfare, Finsbury-avenue, in lieu of the old one that was stopped up and appropriated for their purposes, and to properly drain and pave the thoroughfare; and it appears that the engineer to the Company suggested that as the sewer was to be put in to the satisfaction of the Vestry, it would be better for the Vestry to put the sewer in themselves and charge the Company with the cost. It was resolved by the Vestry to carry out the work, and Mr. Griffiths obtained the contract at scheduled prices. The Surveyor gave Mr. Griffiths the order to construct this sewer, and after that to pave the thoroughfare; and the sewer was constructed, as was supposed. Mr. Griffiths not undertaking this sort of work, gave it to a man of the name of Potter, who is now carrying out a large contract for the Hackney Board of Works. Mr. Griffiths undertook to find all the material, and Potter undertook to dig the trench, find the timber for strutting the work, and go for the bricks to Mr. Griffiths's brick merchant, as he required them. The work was supposed to be done during the day, and it was superintended two or three times a day by the surveyor and the assistant surveyor; but for some reason or other the works were carried on after the usual hours till something like eight o'clock at night. The men seemed to know there would be no inspection then, and their plan it seems was to rush away with 4½ in. work and cover it in, leaving a ring of 9 in. work showing, so that the sewer is to a great extent 4½ in. work instead of 9 in. The ground has been opened, and the matter has been referred to the Paving Committee for inquiry as to who is responsible for passing such work. The trick was made known by a man who had been engaged on the work.

One member of the Vestry reasonably enough thought it strange that Mr. Griffiths had not noticed the number of bricks that had been used by Mr. Potter.

THE MANNERS MEMORIAL CHURCH.

THE designs of Mr. W. Oldham Chambers, architect, of Lowestoft, have been accepted for the church in Newmarket, to be erected in memory of the late Lord George Manners, son of the Duke of Rutland. The church will be commenced immediately.

WORKMEN'S CLUBS AND SOCIAL REFORM.

SIR, — The Council of the Working Men's Club and Institute Union, in whose name I write, are convinced by every day's experience that workmen's clubs and institutes, properly managed, are calculated largely to promote the welfare of the people of this country.

There could hardly be a more important aim than that of enabling the working population to deliver themselves from the evils of public-house resort, and at the same time to find opportunities for mental culture, for refined recreation, and for the judicious investment of their savings.

These objects are being accomplished by many of the institutions, the establishment and management of which the Working Men's Club and Institute Union seeks in various ways to promote throughout England. The Council, therefore, invite the co-operation of all social reformers and philanthropists of whatever class or profession. They offer copies of their publications, their advice, and their personal services, without charge, to every one interested in this work.

They particularly desire, through the publication of this letter, to obtain the services of "corresponding members" of their Society. In other words, the Council invite men of all classes, clergymen, laymen, artisans, and others, to keep the Council informed from time to time of any opportunities that may offer themselves for the establishment of workmen's clubs and institutes, or for the improvement of those already existing; also to acquaint them with the names of persons willing to take part in setting such institutions on foot.

I hope that many of those who may read this letter will communicate with us.

HODGSON PRATT, Vice-Chairman.

THE "GRINDING MONEY" QUESTION.

SIR,—Will you kindly permit me space in your journal to correct a few errors made by a person who signs "A Member of the Association of London Builders" in your issue of the 3rd instant. First. It states in former times two hours' notice was only given to carpenters when discharged. In those times we were paid by the day and always received two and a half hours' notice, which was never disputed by the trade. Secondly. He announces that "grindstones are now kept constantly revolving,"—that is only in shops where machinery is kept; not a word is said about those who are discharged from buildings and out-door jobs; certainly there is not the same convenience for them, and at the present time there are shops where the grindstones are in very bad order, and some with no means of grinding whatever. But this two hours' notice question does not not apply to grinding only, but to the putting in order of the whole of our *kit*, and when twenty or thirty men are discharged at one time, two hours is not sufficient. Thirdly. It is stated "the Carpenters' and Joiners' Union" have taken this case up. I assure you it is not a Union question, but is taken up by the trade at large, and, I am pleased to say, well supported by them. We have also the support and sympathy of every branch of the building trade. Fourthly. It is stated the master builders cannot see the justice of giving two hours' pay on discharge, and have declined to discuss the question. Now, it seems strange that the principal firms should give the two hours, and only the small and insignificant ones refuse to do so. I trust you will publish this, in order to give the public an idea how the question stands.

J. R. BOUTCHER.

Miscellanea.

New Asylum in Boulogne.—Lately the Maire of Boulogne laid the foundation-stone of the new Communal Asylum. The buildings now used for that purpose form a portion of the Hospital St. Louis, and are required by that establishment for legitimate hospital work. The want of a better asylum and of a convalescent hospital had been a question which successive municipal councils were unable to solve for want of funds until 1864, when M. Louis Duflos, a wealthy gardener, died, leaving to the town of Boulogne six acres of land situated at the corner of the Rue de la Paix and the Rue de la Colonne (since named the Rue Louis Duflos), and valued at 8,000*l*., with the proviso that an establishment should be built thereon. In addition to this welcome gift he also left another piece of land and 400*l*. to build a free school for both sexes. The new asylum will contain large and airy accommodation for 240 infirm and aged men and women. The sexes will be in separate buildings, each of which will have its own garden, yards, &c. The estimated cost of the buildings, which will occupy nearly four acres, is 24,000*l*. The contractors have undertaken to deliver the asylum finished by the 1st of April, 1878. The remaining two acres are reserved for a convalescent hospital, which will be taken in hand later. So soon as the asylum is removed from the Hospital St. Louis, the latter is to be restored at a cost of 10,000*l*.

Restoration of St. Alban's Abbey.—Sir Gilbert Scott has just concluded his report to the Marchioness of Salisbury upon the above beautiful and venerable building, the restoration of which her ladyship has taken under her patronage. Referring to the Eastern or Lady Chapel, and the ante-chapel, Sir Gilbert Scott reports:—"When we come to consider the present condition of these charming chapels, once resplendent with architectural beauty, and replenished with objects of the highest interest and richness of decoration; their ceilings glowing with colour, and rendered instructive by the sacred subjects they illustrated; their windows filled with stained glass, their floors enriched with encaustic tile and marble, and made venerable by sepulchral brasses, while in the midst stood the beautiful shrine of the proto-martyr's friend, of rich stonework below and jewellery above; and around it, in the ante-chapels at least, five altars with their accompaniments, and further on, in the Lady Chapel, the high altar of St. Mary, with the smaller altar in the vestry dedicated to the Saviour and His transfiguration,—when, I say, we come to consider the present condition of this once lovely group, how melancholy is the contrast."

Mr. Doowra.—The Emperor of Austria has conferred the Knight's Cross of the Order of Franz Joseph upon Mr. Thomas Doowra, contractor, of London.

Jedburgh Abbey.—Operations are to be forthwith commenced with the view of putting these ruins in a satisfactory condition. The Marquis of Lothian visited the Abbey the other day in company with Mr. R. Anderson, architect, who has acted as his adviser in the matter, and an understanding was then come to as to the portion of the work to be first taken in hand. According to the *Scotsman*, the partition wall and roof will now be removed, so as to disclose the proportions of the original structure; and it will then be necessary to clear away a thick incrustation of paint and plaster in order to show the stone-work of the piers and arches. The next thing to be done will be to take steps for preventing the decay of the ancient walls. What Mr. Anderson now proposes to do is to remove the topmost course of masonry, to lay down a sheet of lead, and then restore the wall-head in such form as may seem desirable. In this way the interior of the walls will be effectually protected, except in so far as moisture may trickle in through the sills of the clearstory or the flag-stones of the triforium, and in the course of next winter several expedients will be tried with the view of ascertaining how this minor danger can best be obviated. When these more urgent improvements shall have been accomplished, the insecure condition of the central tower will claim attention.

Damage to the Parthenon.—A correspondent of the *Athenæum* writes:—"Those interested in ancient historical relics will be sorry to learn that the Parthenon at Athens is being shockingly wrecked and ruined. Tourists every season visit it, knock off limbs of statues, pull down portions of the frieze which Lord Elgin left, and, clambering up with hammer or stone, break off bits of the Doric capitals. These capitals, it will be remembered, are painted with rows of leaves, which are supposed to be bent double under the weight of the architrave, and relic-hunters seem to be especially fond of chipping this portion of the masonry. Not a fortnight ago a tourist knocked off the finger of one of the finest statues, as he wished to add to his private collection of curiosities at New York. The Greeks have determined to protect the building as much as possible, and to store up in a safe place the most interesting and valuable of the fragments of sculpture which lie all over the place, exposed to rude winds, 'and men more savage still than they.' They have almost completed a museum at the back of the Acropolis, but the work has come to a standstill for lack of money. This fact has only to become known amongst artists and art-lovers in this country, and doubtless immediate steps will be taken to preserve that noblest remnant of Greece in her glory—the Parthenon."

Presentation of Gas Standards to the Lincoln Cathedral.—On Saturday last the formal presentation to the Dean and Chapter of the gas standards which have been placed one on either side of the altar enclosure, and the cost of which has been defrayed by a private subscription among a number of the attendants at the cathedral services, took place. The standards, which have been manufactured by Messrs. Barkentein & Krall, of Regent-street, London, are between 16 ft. and 17 ft. in height from base to summit, the bases being 3 ft. 4 in. in diameter, each supported by four ornamental buttresses, terminating in lion's claws. The buttresses communicate with the centre shaft, which at its thickest is about 6 in. in diameter, by open fret work, and the shaft gradually narrows till it terminates in a cross with five lights branching above it. On each standard there are four collars or rings of lights, the largest of these collars being 4 ft. in diameter; and there are also twelve small branches of three lights each. The smallest ring of lights is 2 ft. 9 in. in diameter. The circular shafts are ornamented with flat pilasters, and the branches and upright pillars are also tastefully designed. The whole of the work is in burnished brass.

Fresh Water from the Sea.—An attempt to supply the pier refreshment-room at Cleethorpes with fresh water from the bed of the sea has just been completed successfully. Men have been employed under the pierhead 400 yards from high-water mark, boring through to the rock, with which they came in contact 72 ft. from the surface; and having penetrated into this chalk stratum 21 ft., a flow of pure fresh water was obtained, yielding 100 gallons per minute through a 2½-in. pipe, and forcing it 16 ft. above the ground.

Death of a Contractor.—Mr. Bedford held an inquest at St. Martin's Vestry-hall last week, upon the body of Mr. George Scott, aged sixty-six, a contractor. It appeared that on the morning of the 19th ult. the deceased was engaged in superintending the excavating work going on for the foundations of a new building at the corner of Tichborne-street, Haymarket. Several carts laden with bricks and earth were passing to and from the hole cleared out to receive the concrete, when, as two of these carts were passing each other, the deceased, from some unexplained cause, got jammed between the wheels of the carts. He called out for assistance, and some of the workmen came up and extricated him from his position. He was then insensible, and groaning very much. He was placed in a cab and conveyed to Charing-cross Hospital. Upon being examined by the house-surgeon it was found he was suffering from concussion of the spinal cord and dislocation of the joint of the right hip. Inflammation of the lungs set in, produced from the shock to the system from the injuries received, from which he died. A verdict of "Accidental Death" was returned.

Ardingly College Chapel.—St. Saviour's College, at Ardingly, where public school education is given on moderate terms to the sons of poor gentlemen, tradesmen, small farmers, mechanics, and others of limited means, advanced another stage last week, when the first stone of the chapel was laid by the Bishop of Chichester. The college of St. Saviour, of which the first stone was laid by Earl Granville in 1865, we have already illustrated. The chapel, to which the interest of those present on the occasion was especially attracted, will be 100 ft. by 35 ft., with a carved and panelled wooden roof, 54 ft. high inside. The nave will be divided from the chancel by a tower 123 ft. high from the floor. The lantern inside will be 85 ft. high. The eastern window will have seven lights, those at the side four lights. The style of the chapel is the Early Geometrical. There is to be a gallery running round three sides above the ante-chapel and nave for the accommodation of the infants and dames. Mr. Carpenter is the architect.

Temperance Hall, Guildford.—The Rev. Basil Wilberforce, rector of St. Mary's, Southampton, laid the foundation-stone of a temperance-hall last week at Guildford. The site was given by Mr. F. Apted, Holmesdale; it will seat 300 persons, and cost 1,600*l*. The architect, Mr. Wonnacott, of Farnham, has to bear the reproaches of an old lady, who sent a cheque in aid of the work, that she thought the teetotallers "might have been satisfied with a building of less architectural pretensions." The Mayor (Mr. E. T. Upperton) was present, not on the ground that he liked teetotalism, to which he declared himself opposed, but because he had a horror of drunkenness. The Rev. R. Trimmer, however, declared emphatically in favour of the cause, and said the hall was to be a public-house but no drink was to be had in it. Nearly 70*l*. was raised, and we are told by Mr. Gill that some thought it down-right foolhardiness to think of raising 1,600*l*. in Guildford for a temperance hall.

New Public Garden for Manchester.—We hear that a scheme for forming a winter-garden, on a grand scale, and a good public garden generally, is now being developed at Manchester. The movement is directed by gentlemen who aim at creating an establishment at once instructive and elevating in its influences. According to the *Garden* its history is briefly this: Mr. Ellis Lever originally bought Mr. S. Mendel's establishment at Manchester, and then offered it to the Town Council for the same sum he had paid for it, offering at the same time 20,000*l*. towards making a public garden of this famous place, which should be in all respects worthy of the city of Manchester. The Town Council declined the offer, and since then Mr. Ellis Lever has himself taken the matter in hand, and, in connexion with a gentleman of much experience in like matters, is now engaged in carrying out the scheme we allude to, and of which we hope in due time to give further particulars.

The New Tyne Bridge at Newcastle.—The new bridge, which is being built by the River Tyne Commissioners across the river between Newcastle and Gateshead, was successfully swung on Saturday last. The operation was effected very easily, a single winch worked by hand-labour being employed, and the operation occupied only about an hour and a quarter.

Over-crowded Dwellings.—A very important question in reference to the over-crowding of private dwellings has lately been disposed of by the Court of Queen's Bench. It arose in the case of the Guardians of Rye Union, appellants, *v.* Thomas Paine, and the opinion asked of the Court was, whether a house proved to be overcrowded, but by only one family, so as to be prejudicial to health, as had been proved, was a nuisance within the 19th section of the 29 & 30 Vict., c. 90, having regard to the 14th section of that Act, and sections 8, 10, 12, and 29 of the 18 & 19 Vict., c. 121. The Court gave judgment in favour of the Sanitary Authority, and their decision will for the future relieve the justices of any difficulty in convicting in cases of overcrowding prejudicial to health, whether or not the overcrowding is occasioned by members of the same family.

Whaley Bridge Mechanics' Institution and Public Hall.—The laying of the foundation stone of a new Mechanics' Institution and Public Hall for Whaley Bridge, on Saturday, was made the occasion of public rejoicing. The designs have been prepared by Mr. Samuel Howard, architect, of Poynton. The structure will consist of a basement and two upper stories. The façade is in the Italian style. The ground-floor, to which access will be obtained by the main entrance, will contain library, class-room, committee-room, and reading-room, the latter being 17 ft. by 30 ft. The upper story will be used as a public-hall, and will be 56 ft. long by 30 ft. wide. The contractor for the building is Mr. Stafford, of New Mills, and the total cost of the structure is estimated at about 1,500*l*.

Burlington Chapel, Ipswich.—The plans for the alteration of Burlington Chapel have been prepared by Mr. Brightwen Binyon, architect, and tenders submitted upon them. The present schools will be thrown into the chapel and the roof raised 7 ft. so as to admit of galleries being put all round the building, which will make the sitting accommodation about 1,060 instead of between 400 and 500 as at present. The following tenders for the work have been received:—

Luff	£4,435 0 0
Cunnold	4,350 0 0
Girling	4,248 0 0
E. & E. C. Gibbons	4,210 0 0

The committee have not yet decided which tender to accept.

The Khedive's Geographical Society at Cairo.—The above society was inaugurated lately, by a first meeting, under the presidency of Dr. Schweinfurth. The president, in the course of his address, said,—The Khedive of Egypt has himself summoned us together. He desires, in the interest both of science and of his country, to found at Cairo a Geographical Society, similar to those which exist in the chief capitals of the two hemispheres, an institution that shall stand as a centre and starting-point for the efforts that are being made to complete our knowledge of the earth,—of Africa in general, and of the national territory in particular. To centralise and encourage these shall be our aims.

Terms of Agreement.—At the Hartlepool County Court, before Mr. E. J. Meynell (judge), the case of Wright *v.* Gill was disposed of. It was an action to recover possession of a house and shop, in York-street, West Hartlepool, under a written agreement. The evidence having been dealt with last court day, the Judge now gave his decision. It may be explained that the agreement in question bore date May 18th, 1874, the property being let from "quarter to quarter," for 5*l*. 10*s*. per quarter, the tenancy to commence on the 23rd of May, determinable by a written quarter's notice, and that such notice was given, to determine, on *May 13th*, 1875. It was also shown that the rent was always paid on the regular quarter days.—His Honour held that the notice given was insufficient.

New County Police Station Wycombe.—The new station which is to be erected at Wycombe, in place of the old station, in New-land, for the County Constabulary, will be built on a site belonging to Lord Carington, adjoining the Hughenden-road, and opposite the Temple Farm buildings. Mr. C. Carter, of Great Marlow, is the architect. The building will be of red brick and Bath stone, and will contain a court-room, 40 ft. by 22 ft., magistrates' retiring-room, witnesses' room, guard-room, and six cells. There will also be residences for a superintendent and inspector.

The New Cemetery, Wellington.—This new cemetery has been opened. It is situated on a plot of ground about 6 acres in extent, nearly one-half being consecrated. The two chapels are placed in the centre of the ground, and are connected by a covered carriage drive over which rises a tower and spire, 90 ft. high. Each chapel is 38 ft. long by 19 ft. 6 in. wide, and is furnished with benches, bier, desks, &c., stained and varnished. The buildings have been erected at a cost of about 2,500*l*. Messrs. Paterson & Sons, of Wellington, are the contractors. The laying out of the grounds has been carried out by Mr. Jones, of Wellington. The whole of the works have been executed from the designs and under the superintendence of Messrs. Bidlake & Fleeming, architects, of Wolverhampton; Mr. B. Shaw, of Wellington, being the clerk of the works.

The British Orphan Asylum, Slough.—The new wing to the building was opened last week. It was at the Midsummer meeting last year that the subject was prominently brought before the supporters of the institution, soon after which the work was commenced, plans having been prepared by Messrs. Edgington & Summerbell, of Windsor, the builders being Messrs. Fassnidge, of Uxbridge. The new building consists of two dormitories, each 68 ft. by 20 ft., and a play-room on the ground-floor of the same size, exclusive of bay windows. The cost has been about 3,000*l*. The new building is in the style of the older part of the building, and will give accommodation for about seventy children; but one of the main purposes of the wing is to relieve the other part of the building rather than to make a corresponding increase in the number of inmates.

Trade Dispute in Cornwall.—A very serious trade dispute broke out recently between masters and men in the great Cornish china-clay district, of which St. Austell is the centre. Of late the china-clay market has been overstocked, and the prices of the inferior qualities have had a serious fall. In consequence of this the employers gave notice to their men that instead of 2*s*. 6*d*. per day of eight hours, the amount at present paid, the wages would be reduced to 2*s*. 3*d*. The men threatened a strike, and last week upwards of 1,300 dropped work, raking out the fires in the clay-drying floors, and throwing about fifty works completely idle. The dispute has since been settled, the masters having consented to open their works on the old terms.

The Soldiers' Huts at Woolwich.—Since it was publicly notified that the soldiers' huts on Woolwich-common were undergoing repair, with a view to the return of their former occupants, or as many of them as might feel disposed to do so, the attention of the authorities at the War Office appears to have been called to the subject, and it has been determined to remove the cottages altogether. It is understood that their site will be occupied by six blocks of model dwelling-houses precisely similar to a number which have just been erected by the Government contractor at the Cambridge Cottages in Mill-lane. This will effect a great improvement.

The late William Mulready, R.A.—The Council of the Society of Arts, at the request of the committee for raising a memorial to the late William Mulready, have accepted the sum of 109*l*. 12*s*. 9*d*., which has been handed over to them in trust, to keep in repair the tomb of this illustrious painter in Kensal-green, and from time to time, as the interest unappropriated for this purpose may accumulate to a sufficient sum, to expend the amount in a medal to be awarded to that student in the Schools of Art in the United Kingdom who exhibits the best drawing from the nude figure, executed in black and red chalk, in the manner so successfully practised by Mulready. The money has been invested in India Four per Cent. Stock.

Increase of Salary for the County Surveyor of Shropshire.—At the meeting of the county magistrates at Shrewsbury for the Shropshire Quarter Sessions, last week, the chairman proposed "That the salary of the county surveyor be increased from 170*l*. to 220*l*. per annum, such increase to commence from the 15th of March last." Mr. Groves received 30*l*. as surveyor of the County Lunatic Asylum, and, with the additional 50*l*., his salary would be 250*l*. After some discussion, Sir C. R. Boughton, Bart., moved an amendment that the increased salary should be granted from that day, which was carried.

The Middle Level, Isle of Ely.—Preparations are being made for erecting a new outfall sluice for the Middle Level drain. The syphons have become somewhat worn, and under all the circumstances it has been deemed advisable to erect a new sluice, from designs prepared by Sir John Hawkshaw. Mr. Webster has agreed to build the sluice at a cost of between 50,000*l.* and 60,000*l.* The plan proposed is to construct a new curvilinear branch drain southward of the middle level main drain, connected with it to the west of the syphons, and returning and emptying itself into the main drain about a furlong on the north side of them, so as not to necessitate any new outfall through the Ouse bank.

Relics in Derbyshire. — The Rev. J. M. Mello, F.G.S., has lately been exploring some caves in the Creswell Crags, on the Duke of Portland's estate in Derbyshire. The principal cave examined penetrates about 50 ft. into the rock, and is very narrow throughout the greater part of its length. A layer of surface soil near the entrance, 6 in. or 7 in. deep, is succeeded by a bed of red sandstone found to be nearly full of bones. Among these are the molars of a mammoth. Several of the bones bore traces of having been gnawed by hyænas. There were also remains of birds and fish, some Roman pottery, and several somewhat rude specimens of flint implements.

Coroners' Court Houses.—On the 1st inst. Dr. Hardwicke, coroner for Central Middlesex, took possession of a spacious building which had been appropriated and fitted up as a coroner's court-house by the guardians of St. Pancras, to enable him to hold his inquests therein for that vast and populous district, instead of being compelled to hold them in various public-houses. The building in question is in the King's-road, closely adjoining the new vestry-hall, and was occupied as one of the relief offices. It is commodious, and is fitted up with a platform and a table and seats ranged round for the juries and accommodation for the press, a retiring-room, lavatory, &c.

The New Chapel at Kneesall, Newark.—On Tuesday afternoon the foundation-stone was laid of a new Wesleyan Chapel at Kneesall. The edifice will be built of brick, and the front will be stuccoed. The windows will be relieved by red brick arches and string courses, and the general appearance of the edifice will be neat and pleasing. The chapel is 41 ft. 3 in. by 16 ft., and the height from the floor line to the the ceiling will be 15 ft. 6 in. There will be a vestry adjoining 11 ft. 6 in. by 10 ft. The architect is Mr. G. Sheppard; and the contractors are Messrs. Whate Brothers, of Newark and Sutton, and Mr. Thomas Henderson is the joiner.

East London Hospital for Children.—The Duke of Westminster laid the foundation-stone of the new permanent building for the East London Hospital for Children and Dispensary for Women, at Shadwell, on the 30th ult. The new edifice is to be built upon the pavilion principle, having separate blocks. The first block will be for the administrative department; the second, a ward for forty-four beds, the third a ward for forty-six beds, and the fourth is to be the isolated ward for cases of infectious disease. The frontage will be 105 ft. long, and the depth of the building about 220 ft. The architects are Messrs. H. S. & C. A. Legg, and the builder is Mr. Ennis, of Commercial-road. The cost of the new building will be about 12,579*l.*

A Statue to Tyndale.—At the meeting of the Metropolitan Board of Works, on the 2nd inst., a letter was received from Mr. W. A. T. Amhurst, stating that several gentlemen were anxious to form a committee, to raise, by subscription, a statue to William Tyndale, the first translator of the Bible into English, and inquiring whether the Board would assist them in obtaining a site, as near as possible to the building of the Bible Society, whereon the statue might be placed; and whether the slip of land between Queen Victoria-street and Upper Thames-street, near Blackfriars Bridge, was available for such purpose. The communication was referred to the Works Committee for consideration and report.

New Wine Stores, Salisbury.—The commodious premises erected by Messrs. Richardson for their new wine-stores, at Salisbury, occupying a large space in the corner of Bridge-street and High-street, about 110 ft. long by 43 ft. wide, were inaugurated recently. The edifice was built by Mrs. Hall, of Salisbury, from plans furbished by Mr. H. Hale, of Doughty-street, London.

Memorial Statue to Richard Baxter.—On Wednesday, the 28th of July, the unveiling of Richard Baxter's memorial statue will take place at Kidderminster. The following is the inscription approved by the memorial committee:—"Between the year 1641 and 1660 this town was the scene of the labours of Richard Baxter, renowned equally for his Christian learning and pastoral fidelity; in a stormy and divided age he advocated unity and comprehension, pointing the way to 'the everlasting rest.' Churchmen and Nonconformists united to raise this memorial, A.D. 1875." The estimated cost of the statue, surroundings, palisading, &c., is about 1,050*l.*

New Police Station, &c., for Lancashire.—At the annual session of the county magistrates, at the Court-house, Preston, on the 1st inst., a sum of 1,200*l.* was granted, on the security of the public rates of the Manchester division, for the purchase of 400 yards of land, and the erection of a police-station thereon, at Harpurhey; and 500*l.* were granted for the purchase of land at Ulverston, and the erection of a police-station; 1,800*l.* for the erection of a new entrance-lodge and gateway at the Preston House of Correction, and for alterations within the prison.

National Monuments in Ireland. — In answer to Mr. Mitchell Henry, Sir M. Hicks-Beach said, in the House on the 1st inst., that Mr. Thomas Deane, an architect by profession, had been appointed to superintend the preservation of national monuments in Ireland. He could not state whether the instructions under which Mr. Deane was to act could be laid on the table, but perhaps his hon. friend the Secretary to the Treasury—this appointment was made not by the Irish Government, but by the Treasury—could inform the hon. member on that point.

The Archæological and Architectural Society of Durham and Northumberland. The second general meeting of this society for the present year took place on Wednesday last week, at Warkworth. The members proceeded to the church, and under the guidance of the Rev. J. W. Dunn, and the president of the society, Rev. W. Greenwell, of Durham, inspected the restorations. The party next visited the castle, and examined the ruins, including the keep; and finished with a visit to the Hermitage.

A Protest against the Expenditure of the London School Board.—The Vestry of Wandsworth have forwarded a resolution to the London School Board, stating that as the parish of Wandsworth is now paying a sum of 1,400*l.* per annum to the London School Board, for which they have received no benefit, inasmuch as the School Board have no school in their parish, and as the Vestry consider the expenditure hitherto has been recklessly extravagant, they, the Wandsworth Vestry, request that the School Board will be more careful in future.

Fall of a Mill Chimney in the Isle of Man.—A chimney which had just been completed at the works of Messrs. Dalrymple, Maitland, & Co., cloth woollen manufacturers, at Union Mills, about four miles from Douglas, recently fell on to the roof of the weaving-shed. One of the workmen, named Robert Green, and two boys, were buried in the ruins, and the man, on being extricated, was found to be dead, and one of the boys, William Clarke, severely injured.

The Talbot Inn.—Two new hop warehouses are about to be erected in Talbot Inn-yard, in Borough High-street, Southwark, for Mr. Stephen Soames, on a portion of the ground long occupied by The Tabard, of "Canterbury Tales" fame. Tenders for the buildings have been sent in, and range from 3,859*l.* to 4,748*l.* Messrs. Wadmore & Baker are the architects. Workmen commenced the work of removing the materials of the old inn on Tuesday.

The Value of Good Principals.—On the 2nd inst., Stiles, a mason, in the employ of Mr. J. Hawkins, builder, Dawlish, was working on some workshops in the course of erection in Balaklava-road, by Mr. J. H. Cox, builder, Weech, when the buildings suddenly came down, bringing Stiles, with the roof and partitions, to the ground. He was severely injured, and had to be conveyed to the Cottage Hospital. It is said the principals in the roof had been omitted.

Re-opening of All Saints' Church, Sandon.—The parish church of All Saints, Sandon, Hertfordshire, was re-opened on the 18th ult., by the Bishop of Rochester, after restoration by Mr. Ewan Christian, architect. The total cost of the restoration has been about 1,300*l.*

The Great Eastern Telegraph Award.—It is stated that the sum awarded by Mr. Russell Gurney, the umpire in the telegraphs arbitration cases, to be paid to the Great Eastern Railway Company by the Postmaster-General is 73,315*l.* and 200*l.* per annum. The payment of the former sum to be made on the 30th inst., and the annual sum to commence from that date. The Postmaster-General is to pay the costs of the company, and the costs of the arbitrators and umpire.

Exhibition in Vienna.—An official circular from the Imperial and Royal Austro-Hungarian Consulate General in London notifies that the Society of Manufactures and Commerce of Lower Austria and the Council of the Corn and Flour Exchange of Vienna have made preparations for holding a similar exhibition and sale this year, including machines, apparatus, implements, and other appliances used in breweries and distilleries.

Byron's Grave.—Under the presidency of Archdeacon Trollope, in the absence of Mr. Disraeli, a meeting of the Byron Memorial Committee has been held at Willis's Rooms, and it has been resolved to place a marble slab over the spot where Lord Byron lies buried, in Hucknall Torkard Church, and to invite further funds for the erection of a suitable memorial of the poet in London.

Electric Clocks for the Glasgow Post-office.—Messrs. James Ritchie & Co., of Edinburgh, have constructed a series of electro-sympathetic clocks for the new Glasgow Post-office. All these are controlled from one place in the postmaster's room, which is electrically connected with the Glasgow Observatory, the last being controlled by the Royal Observatory, Greenwich.

An Ancient French Mansion for Sale.—The historic Château de Vaux-Praslin, which formerly belonged to Fouquet, who entertained there his Royal master Louis XIV., is about to be sold by auction. It was built by Mansard, the architect of the palace at Versailles, and Le Vau, and decorated by Lebrun, and is probably the most magnificent building of the seventeenth century extant in France.

The Channel Tunnel adopted by the French.—The Submarine Channel Tunnel Bill (*projet de loi*) has been adopted unanimously, and without any material amendments, by the special committee of the French National Assembly, and the draught of M. Krantz's report has been communicated to the Minister of Public Works, previously to being lodged with the Questure.

New Schools for North Ormesby.—Mrs. J. S. Pennyman, of Ormesby Hall, laid the memorial-stone of the first school built by the Ormesby School Board at North Ormesby, Middlesbrough. Including the land, the school will cost about 7,000*l.*, and will accommodate 500 infants and 350 girls. A new wing is to be built to the Pennyman Board Schools at a cost of about 1,000*l.*

New Banking Premises at Mexborough. The rapidly increasing town of Mexborough has induced the Sheffield Banking Company, who has had an office there for some time, to erect a new and substantial building. The erection, which has been built by Mr. Ripley, contractor, of Rotherham, is so far completed as to permit business being carried on in it.

Fire.—On Sunday morning, shortly before one o'clock, a destructive fire occurred on the premises of Messrs. Hewetson & Milner, upholsterers, in Chenies-street, Tottenham-court-road. It broke out in a building of three floors, used as workshops and store-rooms. The first and second floors and the roof were destroyed, and the rest of the premises seriously damaged. The cause of the fire is unknown.

Loans to Local Authorities. — A return presented to the House of Commons shows upwards of 83,000,000*l.* as owing by the local authorities of England and Wales in respect of loans made to them. The return states that since 1869 the Metropolitan Board of Works have raised from the public 7,826,000*l.* at 3½ per cent.

The New Railway Station at High Wycombe.—We are informed that the new works at High Wycombe Station, which had been promised by the Great Western Railway Company, have now been commenced, and that when completed the public will appreciate the additional comfort afforded to them.

Accident at the Rev. Newman Hall's New Church.—As the workmen engaged upon the extensive works in connexion with Christ Church, now being built for the Rev. Newman Hall, were leaving for dinner, last week, an accident occurred, whereby a man was precipitated to the ground, a distance of 60 ft.

Arbitration in Wages Dispute. — Mr. Chamberlain, the Mayor of Birmingham, who undertook to act as umpire in the wages dispute between the Gloucestershire colliery-owners and their workmen, has decided in favour of a 10 per cent. reduction, instead of 15 per cent., as required by the employers.

Public Park for Sheffield.—A committee of the Sheffield Town Council have recommended that the town should purchase Meersbrook Park as a public park. Its extent is upwards of 100 acres, and the committee recommended that the town should offer 500*l.* an acre for it.

Elsley's Patent Sash Lever.—One advantage of this arrangement is that several sashes may be opened with one action of the lever, and that it can be applied to sashes either hung on centres or with hinges falling inwards. It is in use in many of the London Board Schools.

A Church Struck by Lightning. — The spire of St. Mary's Church, Birkenhead, which is about 150 feet high, has been struck by lightning, and the head of it shattered, the stones being hurled to the ground at a great distance.

A Railroad at Newfoundland.—Newfoundland is to have a railroad, to be built across the island, the length of which will be about 300 miles. The cost of the enterprise is estimated at from four to ten millions of dollars.

Tender for Stables for the Bristol Tramway Company.—The Tender of Mr. A. Krauss, builder, of Colston-street, has been accepted for the erection of the stables and car depôt of the Bristol Tramway Company.

Opening of the Cottage Hospital, Erith. The new Cottage Hospital for Erith, Crayford, Belvedere, and Abbey Wood, has been opened under very favourable circumstances.

TENDERS

For finishing the carcasses of seven houses and shops situate on Holborn Viaduct, for the Holborn Viaduct Land Company (Limited). Mr. E. N. Clifton, architect. Plot D:—

Patrick	£22,970 0 0
Macey	22,805 0 0
Ashby & Horner	22,709 0 0
Conder	22,593 0 0
Holland & Hannen	22,360 0 0
Ashby Brothers	21,825 0 0
Brass	21,725 0 0
Peto Brothers	21,264 0 0
Lawrence	21,872 0 0

For the first portion of a new church, exclusive of seats, heating, and lighting, at Earlestown, Newton-in-Makerfield. Messrs. Whitley & Fry, architects. Quantities by the architects:—

Rome	£6,457 0 0
Middlehurst	6,333 0 0
Winnard	6,170 0 0
Fairhurst	5,739 0 0
Pennington	5,712 0 0
Yates	5,680 0 0

For alterations, decorations, &c., to St. Giles-in-the-fields. Mr. A. W. Blomfield, M.A., architect. Quantities supplied by Messrs. Gardiner, Son, & Theobald:—

Clark & Mannooch	£993 0 0
Patman & Fotheringham	833 0 0
Pitman & Cuthbertson	830 0 0
Warne	786 0 0
Holland & Hannen (accepted)	779 0 0

For painting and decorations at the Gresham Club, King William-street, E.C. Mr. T. E. Knightley, architect:—

Newman & Mann	£842 0 0
Kettell & Son	825 0 0
Pitman & Cuthbertson (accepted)	825 0 0

There being "a tie," lots were drawn, with the above result.

For the erection of a villa residence at Lancing. Mr. R. A. Came, architect:—

Miles	£1,525 0 0
Terry	1,490 0 0
Wells & Miles	1,364 0 0
Colwell	1,290 0 0
Eldridge (accepted)	1,148 0 0

For the erection of a villa residence at Lancing. Mr. R. A. Came, architect:—

Watson	£1,500 0 0
Terry	1,153 0 0
Oxley	990 0 0
Mighall	975 0 0
Eldridge (accepted)	950 0 0

For the erection of an entrance lodge, Luccenden:—

Longley	£290 0 0

For the erection of a villa residence, Horsted Keynes. Mr. R. A. Came, architect:—

Mighall	£1,238 0 0

For the erection of school and class-rooms at Chislehurst, Kent. Messrs. John Tarring & Son, architects:—

		Extra for quarried glazing in lead.
Roberts Brothers	£1,223 0 0	£22 0 0
Boden	1,196 0 0	15 0 0
Perry & Co.	1,150 0 0	20 0 0
Richards	1,131 0 0	12 15 0
Adcock	1,095 0 0	17 10 0
Grubb	969 0 0	13 0 0

For the erection of residences in connexion with the above:—

Richards	£939 0 0
Perry & Co.	930 0 0
Roberts Brothers	911 0 0
Adcock	900 0 0
Boden	895 0 0
Grubb	798 0 0

For the erection of six cottages at Hollacombe, Torquay, for the Torquay Gas Company. Messrs. J. Tarring, Son, & R. Stark Wilkinson, architects:—

Shaddock	£1,290 0 0
Sanders	716 0 0

For alterations and decorations to a villa residence at Erith. Mr. Herbert Ford, architect:—

Tongue (accepted)	£326 11 0

For alterations and additions to Byfield House, Barnes' for Mr. A. Nesbit. Messrs. Tress & Innes, architects:—

Carless	£747 0 0
Adamson	660 0 0
Sale	639 0 0
Sims	625 0 0

For erecting a detached residence, London-road, Croydon:—

Ridge & Kingaland (accepted).

For residence at East Harptree, Somersetshire, for Mr. C. A. Kemble, Harptree Court. Mr. E. T. Boston, architect. Quantities supplied by Mr. H. S. Benison. The stone, brick, lime, sand, and haulage, being supplied by the proprietor:—

Martin	£9,347 10 1
Stephens & Bastow	8,670 0 0
Bladwell	8,463 0 0
Hayward	8,378 0 0
Veals	8,150 0 0
Maggs & Chedsey	8,000 0 0

For villa residence, &c., at Market Harborough, Leicestershire, for Mr. G. Emery. Mr. F. T. Mercer, architect. Quantities supplied:—

Spencer	£1,670 0 0
Litchfield	1,660 0 0
Fletcher	1,650 0 0
Bassett	1,621 0 0
Palmer	1,595 0 0
Moore	1,501 0 0
Hall (accepted)	1,494 0 0

For house, shop, bakehouse, &c., at Kempston, Beds, for Miss Pestell. Mr. F. T. Mercer, architect:—

Haynes	£644 10 7
Lilley (accepted)	576 10 0

For the erection of three houses and shops in the Rendlesham-road, Clapton, for Mr. W. Davis. Mr. H. Shaw, architect. Quantities supplied by Messrs. Stoner & Sons:—

Stamp & Bowtle (accepted).

For alterations and repairs to the Prince of Wales public-house, Hyde-road, Hoxton, for Mr. W. Wooder. Mr. J. G. Needham, architect:—

F. & F. J. Wood	£391 0 0
Palmer	365 10 0
Terry	345 10 0
Hayworth	329 0 0
Judd & Hawkings	256 0 0

For Oxford main drainage. Contract No. 5. Mr. W. H. White, engineer:—

Bugbird	£36,000 0 0
Dickinson	33,990 0 0
Neave & Son	31,576 0 0
Acock (accepted)	29,500 0 0

For alterations and additions to the Market Hall, for the Corporation of Chesterfield, Derbyshire. Mr. S. Rollinson, architect:—

Fidler	£1,453 0 0
Forrest	1,420 0 0
Stevenson & Weston	1,393 0 0
Rollinson	1,380 0 0
Slim (accepted)	1,320 0 0

For proposed villa residence at Hampstead, for Mr. C. Kilburn. Mr. T. K. Green, architect. Quantities supplied by Mr. Chas. Poland:—

Longmire & Burge	£2,886 0 0
Browne & Robinson	2,836 0 0
Newman & Mann	2,805 0 0
Scrivener & White	2,786 0 0
Dove Brothers	2,675 0 0
Manley & Rogers	2,627 0 0
Sharpington & Cole	2,547 0 0

For the erection of new buildings, for Messrs. Sutton & Sons, Reading. Messrs. Wm. & J. T. Brown & F. W. Albury, architects:—

General Works.

Parnell & Son	£2,413 5 0
Simonds	2,291 0 0
Woodbridge	2,197 0 0
Searle	2,190 13 0
Strong Brothers	1,927 0 0
Filewood	1,898 0 0
Hunt	1,800 0 0

Roof only.

Parnell & Son	£1,440 15 0
Braby & Co.	1,389 0 0
Hunt	1,158 0 0

Entire Works.

Cook & Green	£3,280 0 0

For building vicarage house, Holy Trinity, Richmond, Surrey. Mr. R. Brewer, architect. Quantities supplied:—

Dove Brothers	£2,815 0 0
Newman & Mann	2,720 0 0
Sweet	2,670 0 0
Gascoyne	2,575 0 0
Sims	2,549 0 0
Carless	2,153 0 0

For house and studio, Steele's-road, Haverstock-hill, for Mr. C. E. Johnson. Messrs. Batterbury & Huxley, architects. Quantities supplied:—

Nightingale	£2,600 0 0
Newman & Mann	2,580 0 0
Greenwood & Sons	2,455 0 0
Manley & Rogers	2,377 0 0
Linsell	2,293 0 0

For new building, No. 10, Cornhill, City, for Mr. A. Pursell. Mr. Richard Roberts, architect. Quantities supplied:—

Baker	£5,580 0 0
Ashby & Horner	5,197 0 0
Ashby Brothers	5,118 0 0
Lawrence & Sons	4,885 0 0
Moreland & Nixon	4,637 0 0
Rider & Son	4,586 0 0
Hill, Higgs, & Hill	4,534 0 0
Newman & Mann (accepted)	4,326 0 0

For alterations at Lyncombe House, Battersea-rise Mr. E. C. Robins, architect:—

Pritchard	£296 0 0
Newman & Mann	256 0 0

For erection of new buildings, Mark-lane, in connexion with Dunster House, Mincing-lane, and for alterations to the existing buildings, for the City of London Real Property Company. Mr. Edwin A. B. Crockett, architect. Quantities supplied by Mr. D. Cubitt Nichols:—

Hill, Higgs, & Hill	£17,460 0 0
Elkington	16,100 0 0
Peto Brothers	15,923 0 0
Patman & Fotheringham	15,870 0 0
Trollope & Sons	15,840 0 0
Laurence	15,710 0 0
Holland & Hannen	15,660 0 0
Sewell & Sons	15,620 0 0
Macey	15,550 0 0
Lucas Brothers	15,340 0 0
Newman & Mann	15,146 0 0
Conder	14,992 0 0
Brass	14,863 0 0
Perry & Co.	14,346 0 0

For stabling, car-shed, &c., for the London Street Tramway Company. Mr. John Glenn, architect. Quantities supplied:—

	Stabling, &c.	Foreman's House.
Hart	£5,985 0 0	£588 0 0
Newman & Mann	5,915 0 0	586 0 0
Wilson Brothers	5,775 0 0	551 0 0
Lown	5,692 0 0	550 0 0
Kelly	5,676 0 0	550 0 0

Accepted for main drainage works in the district of Chesterfield Union, Derbyshire, for the Rural Sanitary Authority. Mr. S. Rollinson, engineer:—

Staveley.	Shirland and Higham.
Pattinson £2,282	£1,329
Wessington.	Killamarsh.
Pattinson £319	£2,012
Hasland.	Tupton. Pilsley.
Frayne & Son... £1,116	£247 £216
Unstone.	Brimington. Bolsover.
Frayne & Son... £1,672	£1,158 £1,267

For the erection of schools, at Feltham, for 300 children, and master's house, for the Feltham School Board. Mr. W. H. Powell, architect:—

Bartlett	£2,253 14 0
Garratt & Wilkinson	2,145 0 0
Linfield	2,093 0 0
Lodge (accepted)	1,911 0 0

For warehouse, Wood-street, City. Mr. Herbert Ford, architect:—

Browne & Robinson	£4,011 0 0
Scrivener & White	3,983 0 0
Perry & Co.	3,924 0 0
Ashby Brothers	3,866 0 0
Brass	3,852 0 0
Lawrence	3,794 0 0
Smale	3,752 0 0
Downs & Co.	3,714 0 0
Crabb	3,683 0 0
Hobson	3,444 0 0
Mark	3,291 0 0

For Union Chapel at Abingdon. Mr. A. Frere, architect. Quantities by Mr. R. Carpenter:—

King	£1,225 0 0
Hunt	847 0 0
Woodbridge	837 0 0
Cassell	778 0 0
Walters	776 0 0
Bishop	750 0 0
Williams	723 0 0

TO CORRESPONDENTS.

Errata.—In the article on Building in Concrete (in our last number) for "tough" in the second column read *rough*; and for "some workmen," in third column, read *sans workmen*.

J. J.—M. M.—J. S.—H. L.—J. P. & Co.—Mr. F.—W. M.—L. H. L.—W. H. L.—Sir F. S.—J. M.—E. G.—W.—R. W.—W. G. S.—E. C.—H.—Dr. R.—Major de W.—Mr. A.—J. W. & Co.—R. C.—J. O. S.—C. D.—W. O. C.—W. H. W.—W. W.—J. G. N.—S. & R.—C. J.—W. D. G.—C. M.—W. H. P.—H. C. T. (the proposal to get rid of sewage by burning it is not a new one).—H. S. S. (too late).—J. C. (in type).—R. E. P. (in type).—Peasant Farming (unavoidably postponed).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, list of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.